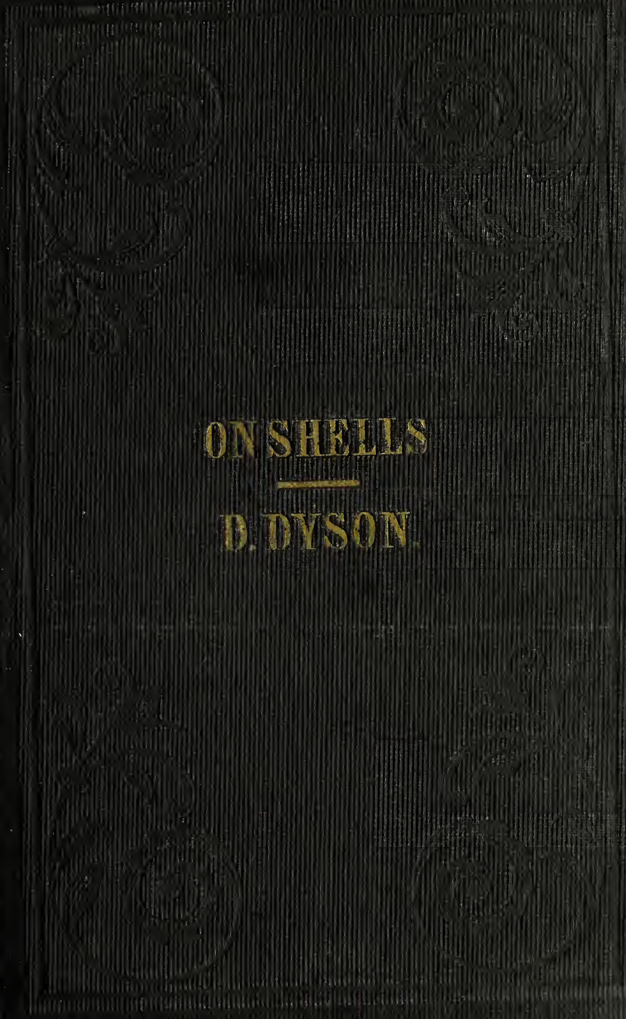

ON SHELLS

D. DYSON.

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THE

LAND AND FRESH WATER

SHELLS

OF THE

DISTRICTS AROUND MANCHESTER:

WITH THEIR PARTICULAR LOCALITIES.

TO WHICH ARE ADDED

INSTRUCTIONS TO COLLECTORS.

BY DAVID DYSON.

MANCHESTER:
JOHN HARRISON, ABRAHAM'S COURT,
MARKET STREET.
1850.

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PREFACE.

HAVING for many years been occupied in the interesting pursuit of searching the woods, hedge-bottoms, ditches, stagnant ponds, and rivers, thirty or forty miles round Manchester, for the Shells peculiar to its locality; and having obtained specimens of nearly, if not quite all, that exist within its limits, I have, agreeably to the wishes and suggestions of several of my friends, endeavoured to furnish such an account as will afford Collectors the opportunity of finding for themselves any of the specimens herein described. With this view I have given the exact locality in which each species can be found.

The study of Natural History in all its branches is exceedingly interesting; opening to the eye of the mind, which had not previously examined this rich store-house, many and wonderful objects; and Conchology, particularly if combined with the study of the animals inhabiting the shells, being not inferior to many other sciences, will bring to light those beautiful secrets and curiosities in nature, which will more than amply repay the inquirer for all his labour. Nor will it fail to point out the exceeding wisdom of the great Creator, who has endowed these tender and otherwise unprotected little animals with a coating, that not only affords them complete shelter, and refuge from their enemies, but presents a perfection of colour and form, which may well constitute a model to the most fastidious artist; not surpassed in beauty even by "the lily of the field." Besides, many of the tiny inhabitants of these shells are calculated to convey to us useful lessons of instruction, would we but study them closely for this purpose. May we not, in the words of the poet,—

> "Learn of the little Nautilus to sail,
> "Spread the thin oar and catch the driving gale."

Of Natural History, it may be said, that it consists principally in the knowledge of species. The Conchologist arranges his shells according to the characters that belong to each individual; and, by the general relation they bear to each other, he forms them into classes, &c. In classifying them he must also become acquainted with the inhabitants of the shells; with their nature, habits, and the elements in which they live.

Even upon superficial examination the works of the Almighty bear witness at once to His goodness, omniscience and power, and that His care is not confined to the higher orders of creation; but that He regards equally the little occupant of the shell which floats in the water, and the monarch of the forest. Yes even here, if man will rightly use those intellectual powers with which the beneficent Creator has endowed him, he will meet with abundant evidence to disprove all the sophistry that has ever been penned against the existence and superintending providence of the All-wise; and he will moreover rise from his study refreshed and delighted with a clearer perception of the Divine goodness, in the wonderful works which He has made.

It may here be stated that the *habits* of the animal influence the structure of the shell. The land shells breathe air, and feed upon plants, and are all *Univalves;* they constitute a family in the Lamarckian system under the name *Colimacea*, or snails, corresponding with the Linnean genus *helix*.

In the aquatic, or fresh water Mollusca, the Anodon, and Unios are generally known by the appellation of horse, or fresh water muscles; their epidermis or skin is generally of a close, thick, coarse-grained nature, often corroded near the umbones.

I have endeavoured in this little work to simplify the whole of its contents as much as possible, in order that any one perusing it, even though comparatively ignorant of Conchology, may, on visiting the districts pointed out, by referring to these pages, find every species of shell in their peculiar locality.

The arrangement adopted is according to Lamarck, to which are added several genera established since the publication of his system.

The descriptions are copied from Gray's Shells of the British Islands, as being the easiest and most uniform of any work on the subject with which I am acquainted.

For the information of individuals who are disposed to commence the study of Conchology, and for those especially who wish to acquire a knowledge of the shells of this neighbourhood, previous to entering into the science generally, I have given a few hints and instructions, for the purpose of facilitating their research; and also a Glossary of the technical terms used in this volume.

In conclusion, I may state, that should my little volume excite in some of my fellow townsmen, an increased taste for the study of natural science, my object will be gained; and let me assure them, that in searching after and studying the varied objects of Natural History, (taking the field for their book) they will find as they proceed, that the difficulties, which at first presented themselves, will gradually disappear—especially in the department to which attention is here called; and that pleasure more than commensurate will ensue—pleasure ever rising in proportion to their mastery of the subject which these pages are intended to illustrate.

INSTRUCTIONS.

In the first place, the collector must furnish himself with a tin scoop about six inches in diameter, with a number of holes in the bottom and sides, that the water may escape. It should have fixed to it a tube or screw constructed to fasten easily to the end of a walking stick. This simple instrument immersed in the water and raking its bottom, is sufficient for scraping up the smallest shells.

A few small tin, or well-made wooden boxes should be provided, for the purpose of holding the shells procured. Chip boxes are liable to fall in pieces.

The collector thus prepared is ready for a ramble; and let him start in any direction he pleases, he is sure to meet with success, for shells abound in almost every pond and ditch he comes to; amongst moss, under stones, upon stone walls, under decayed leaves in abundance, and in woods, crawling up boles of trees, under hedges, and on grass knolls and banks, nicely shaded from the sun.

I would particularly advise the collector to keep strong and heavy shells, separate from the small, thin, delicate ones. A little grass should be placed in the box with the shells, to prevent them from rolling about and sustaining injury. On reaching home, he should separate the Univalves from the Bivalves, and having put the former in a basin, pour boiling water upon them. This is the most humane and expeditious mode of taking away the life of these animals, for by it life is gone in an instant; and the animal becomes so loosened from the shell, that it can easily be removed with a pin or needle. He should also have another basin containing clean cold water, into which to drop his shells gently, as they become severed from their inhabitants. Afterwards with a jeweller's brush, he may remove the slime, and mud, taking special care not to break the lip of the shell, that being one of its chief characteristics and ornaments.

The Bivalves in general require to be placed in a pan over the fire, and boiled for about five minutes, or in fact until they open; then the animal must be carefully extracted, and the shells brushed and washed clean, and be immediately tied round with a thread, and kept in that state till dry, when they are ready for the cabinet. Every shell with an operculum should have it taken from the animal, and when washed it should be placed again in its own shell. Some shells will be found so very small that it will almost be impossible to extract the animal from them. In this case after placing them for a short time in boiling water, and washing them, it is best to allow the animal to dry up.

It may here be necessary to point out several of the localities to which the collector may direct his attention, and so be enabled to begin his career at once. This I do, notwithstanding the localities of the shells will afterwards be specified when their descriptions are given in their proper places.

The Manchester Old Water Works at Beswick, and ponds adjacent, abound with the various species of *Lymnea,* amongst which is *Lymnea Stagnalis* with its four varieties. In the Reservoir of the Water Works, the *Dressina Polymorpha* exists in the greatest profusion, varying in size, colour, and shape. They adhere to the stones at the bottom and on the sides of the embankment, and can only be obtained when the water is about a yard or more below its usual height.

All the country from Beswick to Droylesden, and as far as the Borough Jail, abounds in stagnant ponds and other waters, consisting of excavations or clay-holes made by brick-makers, most of which contain a great variety of fresh water shells.

Chorlton Fields and Hough-end Clough* are excellent places for both land and fresh water shells.

From Jackson's Boat across the country to Baguley Moor, thence to the river Bolling, and to Bowdon, are equally excellent.

From Cheetham Hill to Heaton Park, in the high road opposite the park wall on the road to Middleton, are found under the hedges, *Helix Hortensis,* with about a dozen varieties, and several others of the more minute species of *Zonites.*

The collector should not hastily conclude that any given spot or neighbourhood, is destitute of shells; for they are often found in places, which to superficial observers, would appear the least likely for them: nay they even live in our cellars; in summer I often discover them in my own, but

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* Commonly called "Ooze-end Clough."

I take only a few, lest I should destroy the brood, and thereby rob myself of the pleasure they afford me in witnessing them gliding slowly and solitarily up and down the damp walls.

THE HOUSE-KEEPER.

(From the Latin of Vincent Bourne.)

By Charles Lamb.

The frugal Snail, with forecast of repose,
Carries his house with him where'er he goes;
Peeps out—and if there comes a shower of rain,
Retreats to his small domicile amain.
Touch but a tip of him, a horn,—'tis well—
He curls up in his sanctuary shell.
He's his own landlord, his own tenant; stay
Long as he will, he dreads no quarter-day.
Himself he boards and lodges; both invites,
And feasts, himself; sleeps with himself o' nights.
He spares the upholsterer trouble to procure
Chattels; himself is his own furniture,
And his sole riches. Wheresoe'er he roam—
Knock when you will,—he's sure to be at home.

MEASUREMENT OF SHELLS.

FIG. 1.—ANADON CYGNEUS, young.

The length will be measured from anterior (a) to posterior (p), and the lines of growth running in the same direction will consequently be *longitudinal* or *concentric; transverse* of some authors. The height will be from the umbones (u), to the *ventral margin.* The points from which the growth of the shell commences, are called the *umbones;* these usually turn towards the anterior part of the shell.

FIG. 2.—LYMNEA STAGNALIS.

The length is measured from the apex, to that part of the aperture (a), at the greatest distance from it. The breadth is in the opposite direction. The *anterior,* or front part of the aperture, is marked (a), where the head of the animal protrudes.

FIG. 1.

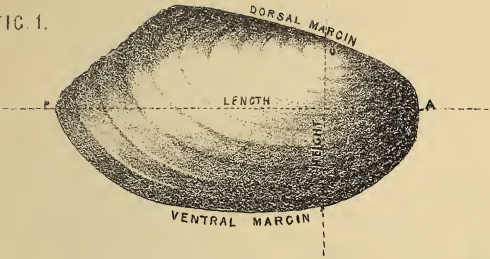
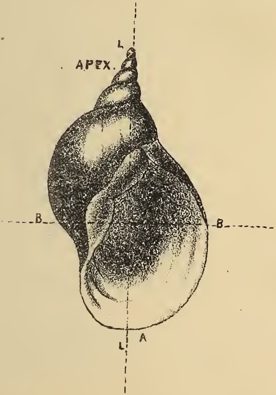


FIG. 2.



LAND AND FRESH WATER SHELLS.

CLASS. CONCHIFERA.

Bivalve.

ORDER. DYMIARIA.

FAMILY. FLUVIATILE CONCHACEA.

GENUS. CYCLAS. (*Lamarck.*) Cycle.

"Animal mantle, produced behind into two elongate contractile siphons; foot tongue-shaped, very extensile; shell suborbicular, nearly equilateral; hind teeth minute, one in the right and two in the left valve; lateral teeth compressed, elongate, lamellar."

CYCLAS RIVICOLA. (*Leach.*) River Cycle.

"Shell subglobose ovate, ventricose rather solid, beautifully and closely striated, greenish brown, with two or three darker bands; edge and lunule yellow; umbones obtuse; cardinal ligament conspicuous."

"The shell is rather solid, blunt within; the umbones paler, and often circumscribed with a dark line; length 10½, height 8½, thickness 6½ lines."—*Gray's Shells of the British Islands, page* 279.

Plentiful in the Leeds and Liverpool Canal, at Burnley; remarkably fine in the canal a few miles from Burton-on-Trent, in the direction of Derby; and near the Ferry over the Trent leading from the Derby road to Repton.

CYCLAS CORNEA. (*Lamarck.*) Horny Cycle.

"Shell suborbicular, globose, thin, very finely striated, umbones blunt; ligament inconspicuous."

"Animal white; the siphons rather elongate, pale flesh coloured, upper rather tapering, lower cylindrical, truncated; foot, when expanded, rather longer than the shell."—*Gray, p.* 280.

Shell three-eights of an inch long, and half an inch broad. Found in Moss-lane pits, Greenheys. These are the only pits in the neighbourhood, that I am acquainted with, containing the true Cyclas cornea.

CYCLAS LACUSTRIS. (*Turton.*) Capped Cycle.

"Shell rather rhombic, compressed, thin, yellowish white, diaphanous; umbones prominent, rather acute, and tuberculose; ligament inconspicuous."

"Animal white; siphons white, elongate.

This species, when in confinement, shews more activity than C. CORNEA; they sometimes remain at the bottom of the vessel with the posterior extremity of the shell elevated, and the siphons exserted. The cup, or swollen part of the umbo, in the ventricose shell of the young animal remaining on the top of the shell, is common to several species of the family, and which, like many other viviparous mollusca, produce their young of a large size compared to their parents."—*Gray*, *p.* 280.

Shell quarter of an inch long, rather more in breadth. Found a little above St. Luke's Church, Cheetham Hill; in a pit in the hollow of Clarke's Fields, on the right hand side of the foot path leading to Blackley. It is also found in some pits behind the Bull and Punchbowl, on the Stretford Road, just below the Botanical Gardens; and in the mud of the pits adjoining Ordsall Clough. There are a few in the Nine Pits, Chorlton Fields, of a transparent bluish colour. These are among the rarest shells in this neighbourhood, but more common in the South.

CYCLAS CALYCULATA. (*Jenyns.*)

"Shell orbicular, rhombic, rather ventricose, subdiaphanous, reddish; umbones less prominent, blackish." —*Gray*, *p.* 281.

Gray places this species as a variety of C. LACUSTRIS; I have often found this shell with CYCLAS CORNEA, in ponds where there has not been a single specimen of C. LACUSTRIS, when C. CORNEA has been in abundance, and C. CALYCULATA the same; therefore, I should think, it is more likely to be a variety of C. CORNEA than C. LACUSTRIS, and am of opinion that there is sufficient reason to consider it a distinct species.

Found in almost every pit in this neighbourhood; but the finest specimens are in the pits on the road-side just before coming to Chorlton. These specimens are always found at the roots of the rushes growing in the pit; and the best way of securing them is to grasp the tops of the rushes, so as to keep them close together before pulling them up. This will prevent the shells from falling out of their retreats into the water. A curious variety, yellow in colour and smaller in size, occurs in a shallow stream, under the stones, close to the property of Lady Fleming, at Ambleside.

PISIDIUM. (*Leach.*)

"Mantle extended behind into a short, simple, contractile siphon; foot, tongue-shaped, very extensile; shell suboval, wedge-shaped, inequilateral; hinge teeth and lateral teeth like Cyclas.

PISIDIUM OBTUSALE. (*Pfeiffer.*) Gibbous Pera.

"Shell globose, obliquely subovate, shining, very finely striated, greenish black, with a yellowish marginal zone, rarely all yellowish; umbones rather prominent, very blunt.

"Animal white; siphons short, obconic; foot very extensile.

"Mr. Jenyns observes, 'It is by far the most active and lively species that I am acquainted with, being always in motion, and residing less at the bottom than the rest of the family.' "—*Gray, p.* 282.

The only locality I know, for this species, is in some pits adjoining Ordsall Clough, Salford, in the weeds and mud at the bottom.

PISIDIUM AMNICUM. (*Jenyns.*)

"Shell ovate, ventricose, deeply sulcately striated; umbones rather blunt.

"Animal white, siphon rather variable."—*Gray*, 285.

Found in Dallam Brook, Little Sankey, near

Warrington, in the mud; and in the river Lune at Lancaster, a little above the aqueduct, in the sandy mud at the roots of grass.

Pisidium Henslowianum (*Jenyns.*) Appendaged Pera.

"Shell obliquely oval, ventricose finely striated; umbones rather acute, with a laminar projection.

"Animal white; siphon short, rather variable; generally rather conical and truncated.

"This shell is easily known by the curious eave-like projections on the umbones, which are evidently formed on the edge of the very young specimens, and then gradually rise to the umbo as the shell increases in size, by the addition of a new laminæ of shelly matter to its edge."—*Gray, p.* 285.

Found in an old pitstead on the new road leading from Ardwick to Gorton; in another in Hough-end-Clough, on the left hand side of the middle bridge, amongst the weeds and in the mud; and in the pits on Baguley Moor; the finest being in the small cuttings connecting the pits.

Pisidium pusillum. (*Jenyns.*) Minute Pera.

"Shell orbicular, ovate, rather compressed, very finely striated, scarcely inequilateral; umbones rather prominent."—*Gray, p.* 283.

Found among the weeds and mud in most of the old pitsteads near Hebden Bridge; and in the ditches near the Signals, opposite Liverpool (on the Cheshire side,) they are very plentiful.

FAMILY NAYADES.

UNIO PICTORUM. (*Lamarck.*) Thin Painter's Unio.

"Shell oval oblong, ventricose, produced into a bluntly truncated beak behind, yellowish green brownish zoned, greenish behind; upper edge nearly straight, lower rather retuse; hinge teeth very much compressed, arched, crenated; hinder teeth of left valve small or evanescent. Young shells with a few isolated conical tubercles on the umbo."—*Pfeiffer*, ii. *t.* 2. *f.* 24. *Gray, p.* 295.

Found in the river Weaver near Northwich. A rake with close teeth is required to drag them out of the mud. They are also found in the canal near Keighley; and in the canal at Welshpool.

UNIO OVALIS. (*Gray.*) Oval Unio.

"Shell elliptical ovate, thick, yellowish green razed, tapering behind; hinder margin slightly arched, or contracted; umbones prominent, wrinkled, often worn; cardinal teeth thick, conical, crenated."—*Gray, p.* 297.

Found in Dallam Brook, near Warrington; and in Little Sankey Mill-pool. Here I and Messrs. Cookes, of Warrington, one afternoon, procured about one hundred specimens, but most of them were corroded at the beaks.

UNIO TUMIDUS (*Retzius.*) Tumid Unio. Mysca Solida. (*Turton.*)

"Shell ovate elongate, wedge-shaped, tumid, produced and attenuated behind, thick, brown; lower edge curved; umbones prominent, rugose; anterior teeth thick, high, triangular, strong; left hinder strong; known from the Unio pictorum, by being much more solid, having larger and stronger anterior teeth, and by its tapering behind."

Found in the canal at Welshpool.

ALASMODON. *(Say.)* Pearl Muscle.

"Shell oblong elongate; hinge with short crested irregular anterior teeth in the right valve, shutting between two in the other valve; posterior lateral teeth small in young, and wanting in the adult shells.

ALASMODON MARGARITIFERUS. (*Gray*) Pearly Alasmodon.

"Shell ovate elongate, rather compressed, thick, heavy, black-brown, truncated below; cardinal teeth thick, conical."—*Gray. p.* 293.

"This shell," says Pennant, "is noted for producing quantities of pearl. There have been regular fisheries for the sake of this precious article in several of our rivers. Sixteen have been found in one shell. They are the disease of the fish analagous to the stone in the human body.

"On being squeezed, they will eject the pearl, and often cast it out spontaneously on the sand.

"The Conway was noted for them in the days of Camden. A notion also prevails, that Sir Richard Wynne, of Gwydir, chamberlain to Catharine, Queen to Charles II., presented her majesty with a pearl (taken in the river) which is to this day honoured with a place in the regal crown. They are called by the Welsh, Cregin Diluw, or deluge shells, as if left there by the Flood.

"The Irt, in Cumberland, was also productive of them. The famous circumnavigator, Sir John Hawkins, had a patent for fishing that river. He had observed pearls plentiful in the Straits of Magellan, and flattered himself with being enriched by procuring them within his own Island.

"In the last century, several of great size were found in the rivers in the counties of Tyrone and Donegal, in Ireland. One weighing thirty-six carats, was valued at £40, but being foul lost much of its worth. Other single pearls were sold for £4. 10s. and even for £10. The last was sold a second time to Lady Glenlealy, who put it into a necklace, and refused £80. for it from the Duchess of Ormond.

"Suetonius reports that Cæsar was induced to undertake his British expedition for the sake of our pearls; and that they were so large that it was necessary to use the hand to try the weight of a single one. I imagine Cæsar only heard this by report; and that the crystalline balls in old cases, called mineral pearls, were mistaken for them.

"We believe that Cæsar was disappointed of his hope: yet we are told that he brought home a buckle made of British pearl, which he dedicated to, and hung up in the temple of Venus Genetrix. A proper offering to the Goddess of Beauty, who sprang from the sea. I cannot omit mentioning, that notwithstanding the classics honour our pearl with their notice, yet they report them to be small and ill coloured; an imputation that in general they are still liable to."—*Donovan's British Shells, vol.* 3.

In the autumn of 1849, I visited the river Lune. At a place called Caton, about five miles above Lancaster, I found these shells in abundance. They can be seen from the banks of the river when the water is clear. They lie between the stones in the mud, with the ends pointing up. On taking a small stick and putting it between the valves, the animal will close the shell, and then it is easily lifted out of the water. But the better way is, at once to go into the stream, as this will save time. I stripped and entered, and by placing the eye near the surface saw the shells distinctly, and gathered them with ease. True, I had not much need to strip to save my clothes a wetting, as I had by accident, a short time previously, slipped into the river with my clothes on; but as the sun was shining brightly, I thought it furnished a favourable opportunity for drying them. I had not thrown on the bank more than about thirty specimens, when I was observed by some *navvies* who were working on the railway close by: one of them shortly after, came within fifty yards, and looked intently at me, evidently to ascertain what I was doing. On quitting the stream, and putting on my clothes, he came up to me, and very civilly asked what I had been throwing out of the river. I told him; and, quite to his astonishment, I set to work opening my shells, and taking out the animals. Immediately he produced his pocket-knife, and assisted me. I had not opened many before a fine pearl, larger than a pea, fell out of one of them.

The scenery in this neighbourhood is magnificent, and well worth visiting by any individual, who has a taste for the beauties of nature, and leisure to admire them.

I had occasion to return through Liverpool, and thence to Warrington. At the latter place, while dining at an hotel, I was thrown into the company of the gentleman who had the management of the railway near the the spot where I had entered the Lune. I told him, that the day before, I had crossed the bridge then in the course of erection. He asked me, if I was the person who had been in the river. When I answered him in the affirmative, he observed, he had seen me, and that his men had conjectured I was after "the diggins;" and that some of them, after I had left, had actually gone to the spot in search of the valuable pearls.

Here I may observe, that these shells are common in the river Conway; and that Da Costa mentions the Tees, the Alne, the North and South Tyne, the Tweed, the Dee, the Don, &c., as inhabited by them; and adds, they generally frequent the deeper parts, and the gulfs, whirlpools, &c. of these, and most rivers where they are found.

ANODON. (*Lamarck.*) Fresh water Muscle.

"Shell oblong, thin, rather compressed behind; hinge margin toothless.

ANODON CYGNEUS. (*Turton.*) Swan Fresh water Muscle.

"Shell oval, tumid, rounder and ventricose in front, compressed and more or less angular above behind, covered with an olive periostraca.

"A most variable species, which seems to assume different appearances under every circumstance; as, for example, in depth, the stillness or motion, and the purity or impurity, or peculiar impregnation of the water, in which it happens to be located." *Gray, p.* 289.

Found in the Park Canal, a large sheet of water in Cheetham; in Ardwick pond; in the canal at Hollinwood; in Dallam Brook near Warrington; in the ponds at Dunham; in the canal at Bardsley Bridge; and in most of the ponds in this neighbourhood, in the mud; very fine in a circular piece of water at Smedley, near the old Hall; and also in the canal near Skipton.

FAMILY. DREISSENADÆ.

"Shell regular; inequivalve, inequilateral; beaks terminal, furnished with a septum; muscular scars three, the central one simple and linear, hinge toothless.

DREISSINA. (*Van Beneden.*) Dreissina.

DREISSINA POLYMORPHA. Zebra Dreissina.

"Shell triangular, keeled, olive, varied with black wavy-lined.

"The animal of this genus differs from Mytilus in the mantle being closed, while in the latter it is open.

"In the latter, the retracting muscles are divided into several bundles, each of which has its proper attachment to the shell, while in Dreissina the muscular cords are united into a single bundle, which has only one point of attachment. In Mytilus, the branches adhere through their whole length; in Dreissina, the extremities are free, and float upon the posterior transverse muscle."—*Gray, p.* 300.

These shells are found in most of the large water-pipes that supply this city, from the waterworks at Beswick. Finding this to be the case, I was induced to examine the reservoir at Beswick, and was much surprised to discover that the embankment stones, at about three feet deep, were literally covered with them, varying from three quarters of an inch long, and one and a half wide, down to the size of a pin's head.

CLASS. MOLLUSCA.

Univalve.

ORDER. GASTEROPODA.

FAMILY. CALYPTRACEA. (*Lamarck.*)

ANCYLUS. (*Geoffroy.*)

ANCYLUS FLUVIATILIS. (*Müller.*) Common River Limpet.

"Shell conoid, with the point recurved, and near one end; aperture roundish oval; disk blueish.

"Animal greyish.

"Shell about a quarter of an inch in diameter, and nearly as much in height, semitransparent, light horn-colour, covered with a dusky green skin, slightly marked with concentric striæ, inside bluish-white, glossy; the crown slightly curved downwards."—*Gray, p.* 249.

Found in a small lateral branch of the brook running through Hough-end-Clough, above the middle bridge, on the right hand side going up the current; in a small rivulet of clear water, that crosses the road, a little before arriving at Baguley Moor; almost anywhere on the banks of the Leeds and Liverpool canal, (very fine;)* also about two miles beyond Stalybridge, at a place called "The Brushes," upon the stones in a busy and sparkling stream that intersects the mountains. This place is well worth visiting, particularly to any one fond of a summer's ramble, who has a taste for the beauties of scenery, consisting of water-falls, mountains, and rivulets.

> "Spring hangs her infant blossoms on the trees.
> "Rocked in the cradle of the southern breeze."
> *Cowper.*

I have been there scores of times entomologising, and have often met with lovers of science from different parts of the country, in search of insects, plants, and bird-eggs. Last summer, (1849) when I, and my friend Mr. Harrison were there, out flew a Water Ousel from some rocks on the banks of the stream. It appeared at first sight, as if hurt; it fluttered on the surface of the water until it reached the falls, where it immediately hid itself beneath them.

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* Also remarkably fine in Bassenthwaite Lake, Cumberland.

On my approach, I thought the poor bird would be drowned; I waited for some time expecting the force of the water would wash it down the stream. A quarter of an hour elapsed, and no bird appeared; I stripped my clothing, and was soon under the falls, and to my astonishment, it sat in perfect safety. It had darted through a fall of water, that almost sent me flying neck and heels over the slippery stones. When it took to its wing, it gave a few chirps, in the "good bye" style. On a moment's reflection, I concluded it must be a female, and that her nest was somewhere near. And in about a week afterwards, I heard of some person having visited this interesting spot, who had taken her nest. The Ring Ousel is also here. I should be sorry to see these birds banished from this place, as they are very rare so near Manchester.

This district is not very prolific of shells, but is highly interesting to the Naturalist in other respects; with scenery peculiarly attractive. The Ancylus Fluviatilis, however, is very fine here, found in the running brook (as before mentioned) which takes its rise in Featherbedmoss, and flows through the valley, emptying itself into the *Tame*, a little above Stalybridge.

Since writing my account of the above shell, a friend of mine has given me the following description of "The Brushes," in verse. These digressions from the subject-matter in hand, may call for indulgence from the friendly reader. They are made for the purpose of inviting him to spend a few hours, on a hot summer's day, in one of the loveliest situations, in the neighbourhood of Manchester.

THE NATURALIST'S CALL TO THE BRUSHES.

Go! visit the Brushes, where insects abound,
And the wild gems of Flora are scattered around:
Go! traverse these woodlands, ere twilight comes stealing
Her last streams of light, the tamed landscape revealing:
There the doings of mortals are hid from our view,
And all we behold is delightful and new:—
    There the moor cock is crowing,
    The brackens are growing,
And nature defies the proud efforts of men.
    The woodlark is singing,
    The wild birds are springing,
And Freedom resounds through this beautiful glen!

Go to the Brushes, when the windlets are still,
And sunshine bespangles the waterfall-rill;
Ascend the bright streamlet, while Phœbus is shining;
Health, Pleasure, and Science, the ramble combining.

Manchester, 3rd month, 1850. H.

I have often spent my sweetest hours at this charming spot. When there, on lovely evenings, I have experienced the most delightful sensations, and been loth to retire, though much needing repose, after the toils of the day.

"The summer sun was lingering still,
As though unwilling to bereave
The landscape, of its softest beam,
So fair,—one can but look and grieve,
To think that, like a lovely dream,
A few brief fleeting moments more,
Must see its reign of beauty o'er."
Watts.

VELLETIA. Lake Limpet.

"The animal like Ancylus but dextral; the shell oblong, compressed, conical, with the apex rather behind the middle, bent to the left, as in other dextral shells; mouth elongate.

VELLETIA LACUSTRIS. (*Gray.*) Oblong Lake Limpet.

"Shell oblong, compressed, with the point slightly recurved in an oblique direction, and nearly central.

"Animal blackish.

"Shell a quarter of an inch long, and hardly a tenth in breadth, extremely thin and transparent, smooth, oblong, compressed at the sides, with the apex pointed, and near the centre of the shell, inclining towards the narrow end, and turning a little obliquely towards the left side."—*Gray, p.* 250.

These are somewhat abundant in the ponds about Freckleton and Lytham; and are attached to aquatic plants.

FAMILY. LIMACINEA. (*Lamarck.*)

VITRINA (*Drapernaud.*) (Bubble Shells)

"Animal—body rather elongate, lanceolate; mantle subanterior, produced into a rugose shield in front, with a central prominence, protected by a thin, transparent, rather depressed, subglobular shell, which is partly covered by the back edge of the shield, and a tongue-like process of the mantle on the right side.

"Shell imperforated; spire depressed, of only a few whorls; mouth large, rounded, lunate; peristome thin.

"This genus is intermediate in form between a slug and a snail, having the shield-like mantle of the one, and the globular external shell of the other genus.

"The shells are very like the *Zonites* in their appearance, but have a much smaller and more depressed spire, more rapidly enlarging whorls, and a much larger mouth; but they are best known by their axis being imperforated.

VITRINA PELLUCIDA. (*Fleming.*) Transparent Glass Bubble.

"Shell green, depressed, hyaline and glossy; whorls three, aperture somewhat oval.

"Animal—light-coloured above, with black head and horns; under part light-coloured, bordered with black; airvalve, when closed, with a black spot, when open, surrounded by a black ring."—*Sturm, Fauna, t.* 9; *Pfeiffer*, l. *c.*

"Shell half an inch in diameter, not so much in height; extremely thin and transparent, of a pale watery green, and quite smooth; volutions three, the first very large and a little oblique, the others but little raised and ending obtusely; aperture very large, oval elliptic, rather oblique, interrupted at top by the prominence of the second volution, with the margin thin and membranaceous, often coloured with a pale brown border, without internal rib; the suture well marked, and when magnified, exhibiting a striated spiral line; pillar lip a little reflected, and forming a slight concavity, but not an umbilicus."—*Gray*, *p.* 120.

Common under decayed leaves in Hough-end Clough, and under brush wood in moderately dry situations in the same localities. They are met with, too, on the banks of the Mersey near Stretford, at the roots of trees amongst the grass. Also on the Bury Road, opposite Heaton Park, under the hedges, and in the grass on the hedge backing; and in most of the woods about Preston. The shells in this neighbourhood are much smaller than the above description represents.

ORDER. TRACHELLIPODA. (*Lamarck.*)

FAMILY. COLIMACEA. (*Lamarck.*)

HELIX. (*Snail.*)

"The animal moderate, with an elongate depressed foot, and a large, produced, central, spiral body, covered with a subglobose or depressed shell, with a lunate mouth, which is generally broader than long, strengthened with an internal thickened rib, and more or less reflected edges: tentacles four, the two lower small, club-shaped.

" These animals have a distinct and very variously divided, *vesicula multifida* which is wanting in *Succinea, Bulimus,* and other allied genera.

" The young shells have the outer whorls generally more or less keeled, and the axis is always umbilicated or perforated, but the perforation is sometimes masked by the reflection of the outer lip of the adult shell over it.

" This genus is known from *Zonites* by the thickening of the outer lip; from *Vitrina* by the axis being perforated; from *Succinea* and *Bulimus* by the axis being depressed (and not elongate) making the shell subglobose or depressed.

" The animals, at the approach of winter, or in very dry weather in summer, recede into their shell, and secrete a quantity of mucus, which, being moulded, as it were, on the retracted part of the mantle which encloses the folded-up foot, forms, when it dries by exposure, a cover to the aperture, which is usually membranaceus, with a triangular perforation over the respiratory hole of the mantle.

HELIX ASPERSA. (*Müller.*) Common Snail.

"Shell somewhat globular, with the surface wrinkled, yellowish-brown or olive, with four brown bands; whorls four; mouth roundish lunate; the peristome white and reflected.

" Animal warty, yellowish-grey, with a paler dorsal streak."—*Rossm. Icon. t.* 4. *f.* 75.

" Shell an inch and a half in diameter, covered with a creased or coarsely wrinkled skin, somewhat globular, with the mouth a little longer than wide, the edge of which is a little reflected; of a dull olive colour, with generally four interrupted brown bands, one, and, rarely, two, of them penetrating the mouth. It varies much in colour and markings, but is readily known by its wrinkled coat. It varies in colour—sometimes they are pale yellowish, without bands, but generally banded; sometimes the bands are all separate, but generally the second and third bands are united into one; sometimes all the bands are united together, which makes the shell appear darker, and marked with transverse pale lines. It varies greatly in size, according to the quantity of food, and the temperature of the place in which it lives.

"The internal spicula or darts, which this species ejects in the spring of the year, are about a quarter of an inch long, slender, and tapering to a fine point, exactly square, with four sharp angles, rounded and hollow at the top like the socket of a joint. A magnified figure may be seen in Lister's Anatomical Tables at the end of his Conchology, *t.* 2, 3, *f.* 1. 2.

"The snail which inhabits this shell seems to be more influenced by the weather than many of the smaller sort; for upon the first appearance of cold they creep into crevices and under stones, clustering together and clinging to each other, as if they were capable of communicating warmth by association.

"They are the pest to gardens, especially such as are enclosed by hedges and old walls. Upon many of them are found a series of thin circular layers placed horizontally; these are the laminar foliations of the winter epiphragm left by another of the species which had been attached to it.

"This snail is collected and sold in Covent Garden and other Markets, as a cure for diseases of the chest, boiled in milk; and quantities of them are collected and packed in old casks, and sent to the United States of America, as delicacies.

"In this manner they travel very well, as they fix themselves on one another round the circumference of the cask, leaving a vacant space in the centre.

The glassmen at Newcastle, once a year, have a snail feast; they generally collect the snails themselves in the fields and hedges, the Sunday before the feast day."—*Gray, p.* 128.

This shell is found about the garden fences at Dunham, but not common; at and near Chester, on the road sides, it is in great abundance. At New Brighton, near Liverpool, upon the garden walls, it is frequently met with; and in some parts of North Wales it may be found in thousands; at Beaumaris it is abundant. In some parts of Yorkshire it is collected in vast quantities by many of our Shude-hill street-quacks, and its molluscus is manufactured into a kind of green salve, and exposed on their stalls for sale as a specific and "*certain*" cure for corns. I have used it for this purpose, and found it efficacious, having been relieved in a few days. I have friends, too, who have used it in the same way, and they have experienced similar relief.

HELIX ARBUSTORUM. (*Linn.*) Shrub Snail.

"Shell somewhat globular, rather solid, brown or yellowish, marbled and marked with a single band; mouth roundish lunate; peristome reflexed white.

"Animal granular, greenish black; hinder part of the foot and beneath grey; tentacles shortish.

"Shell about three quarters of an inch high, and as much in diameter, but variable in size and proportion, striate, mostly brown, marbled with small yellowish spots, or greenish-yellow with whitish spots, with a single blackish band, which winds round the middle of the lowest volution, and continues round the base of the rest, not penetrating the aperture. This band is often faint, rarely wanting, aperture semielliptic, longer than wide, more produced at the pillar side, with the margin slightly reflected, and white, with a white internal rib."—*Gray, p.* 137.

Common in the neighbourhood of Jackson's-boat, Cottrel-clough, Baguley, and near the river Bolling, on the hedge backings.

These vary, but not so much as either HELIX NEMORALIS, or HELIX HORTENSIS.

They are found on the limestone soils at Kilnsey Crag, and Kettlewell, in Yorkshire, without the band; the colour yellowish white, with a few motlings: at Preston, plentiful on the old tram-road which joins the Summit canal to the Lancaster canal. There is a white variety at Southwell in Nottinghamshire, and at Castleton in Derbyshire.

HELIX NEMORALIS. (*Linn.*) Girdled Snail.

"Shell somewhat globular, smooth, yellowish or brown, and mostly five-banded, with the mouth roundish lunate, compressed; margin of the aperture brown.

"Animal dirty or yellowish grey; head, tentacles, and two streaks from the tentacles, blackish."—*Sturm*, *t.* 24.

"Shell hardly an inch in diameter, and about three quarters high, glossy, semitransparent, finely striate; spire composed of five rounded volutions; aperture semielliptic, longer than wide, the peristome produced at the pillar in a nearly straight line, where it is flattened and thickened, surrounded by a chocolate, or reddish brown border.

"This shell varies:—1. Greatly in the intensity of the colour; being sometimes pellucid white, yellow, reddish, or brown,

2 In being plain, or marked with five or fewer bands (some of the bands being deficient.)

3. In the bands varying very considerably in breadth, being sometimes narrow, at others broad, when two or more of them are often confluent.

4. The bands are generally black or brown, but sometimes pellucid, and nearly colourless.

5. In size, according to the abundance of food, or locality.

"When the shells are lying exposed to the sun without any shelter, their upper surface often becomes of a fine pink or rose-colour.

"On this animal is sometimes found a parasite insect, which has caused considerable interest among the entomologists, and which has proved to be the larva of *Drilus flavescens*, (see Mielzinsky, Isis xvi. 1825, p. 477.)"—*Gray, p.* 132, 133.

This is one of the most beautiful of our snails, and none vary more, particularly in colour and markings. I have found at least fifty distinct varieties. They are common at Chorlton, about garden fences, and in the lanes on the hedge backings; but they are much finer in the neighbourhood of Jackson's-boat, on the Cheshire side of the river, upon nearly every hedge backing as far as Baguley and down to the river Bolling.*

This is a most delightful walk in spring. When the migratory birds arrive, nothing is more pleasing than to see them fleeting in every direction, and to hear them pouring forth their melodious song. Vegetation here is luxuriant, and fields are looking charmingly green, studded with the daisy, the cowslip, and the buttercup. In the shade, among the trees, when they are decked with much of their summer's foliage, the eye is captivated with abounding clusters of the modest primrose. A meditative walk in this lovely locality, and in others similar, has frequently afforded me more pleasure, and more matter for refined contemplation, than months spent amidst the din and bustle of our interesting commercial city.

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* At Preston, Lytham, Southport, Formby, &c. and at Naze Point, they frequently occur of a brown colour, and occasionally the same colour striped. At Exeter, they are found with one stripe on a brown ground, and are rather common: this applies also to Torquay. At Bangor, Beaumaris, and adjacent parts, they are found of a fine dark red colour. They are particularly fine at Cambridge and Cheltenham.

Helix hortensis. (*Lister.*) Garden Snail.

"Shell somewhat globular, thin, smooth, yellow or brown, uniform or banded; mouth roundish lunate depressed, with the peristome white.

"Animal reddish, yellowish, or pale grey; tentacles generally dark grey, *Sturm*, *t.* 22.

"Shell about a fourth part smaller than H. nemoralis, which in colour and varieties it much resembles; but is distinguished, by its smaller size, in not being quite so convex, in being more polished and thinner, and in the white margin round the aperture."—*Gray*, *p.* 130.

Found on the Middleton road opposite Heaton Park, upon the hedge backings. Here is a variety, amongst about a dozen others, nearly white, with transparent bands, rare; and the same sometimes occurs in H. nemoralis. Found also at Preston, and in most neighbourhoods.

Helix hybrida. (*Pioret.*) Brown-mouthed Snail.

"Shell somewhat globular, smooth, polished, brown or yellow, brown-banded, with the rib of the lip pale brown, and the edge whitish. Helix hortensis var. *Ferussac, Table,* 31; *Alder. Mag. z. & b.* ii. 106.

"Inhabit woods and hedges with the former.

"The animal of this species differs from either HELIX HORTENSIS or H. NEMORALIS in the form of the *vesicula multifida*, as well as in the colour of the mouth of the shell.

"In all its characters it is intermediate between these two species, but yet, I do not believe that it is a mule, or that it unites them into one species.

"This species does not seem to be so variable in its colours as either of its allies.

"Mr. Alder notices this species in his Catalogue of Newcastle shells.—'A curious pale brown variety of this species (H. hortensis) occurs at Stella, the lip being of a paler shade of the same colour, and rarely white.'

"M. Deshays believes this animal to be the mule of the two species as the name indicates; he says they are not sterile.—(*Lam. H. ed.* 2. vi. 53.) He had not observed the peculiarity in the *vesicula multifida*."—*Gray, p.* 132.

Thomas Glover, Esq. has a selection of the three last mentioned species all running one into the other; so much so, that it is a difficult matter to make more than one species from his shells; and as shells do not hybridize, I should think H. HYBRIDA is nothing more than a variety of HELIX HORTENSIS. Found at Malton, in Yorkshire, with H. HORTENSIS.

HELIX ERICETORUM. (*Müller.*) Heath Snail.

"Shell depressed, semitransparent, grey or brownish, and generally banded; aperture roundish; umbilicus very large and deep.

"Animal greenish white; foot slender, pellucid, (*Sturm, Fauna. t.* 24.)

"Shell nearly an inch in diameter, much depressed at top, slightly striolate, of a grey or rusty brown colour, with generally a brown band above, continuing round the edge of the smaller volutions; sometimes the bands are so obliterated as to be hardly visible; aperture nearly orbicular, not much interrupted by the penultimate volution, longer than broad, the peristome very thin and not reflected; umbilicus very large, and so open and deep as to expose three or four of the volutions. This shell varies greatly in colour, being often distinctly banded, and at other times quite bandless."—*Gray, p.* 163.

Found on the hill sides near Kettlewell; very common on the banks of Arncliffe-beck, Yorkshire, on the sandy soils; also found at Scarborough castle, Torquay, Coggeshall, &c.; and likewise at Roscrea, in Tipperary, Ireland.

HELIX CAPERATA. (*Montagu.*) Black tipped Snail.

"Shell flattish, yellowish, with brown interrupted bands and spots, and strongly striated concentrically; umbilicus moderate; mouth white.

"Animal yellowish-ash, warty above, foot thickish.

"Shell seldom half an inch in diameter, and a quarter of an inch high, rather depressed; the larger volution sloping to a somewhat carinate edge in the middle, with regular deep transverse striæ; colour dull yellowish-white, with regular brown bands, which are often interrupted, and the lip black; aperture crescent-shaped, as long as it is broad, with the margin thin and not reflected over the umbilicus, which is large and deep."—*Gray, p.* 162.

Common on the sandy soils on the coast of North Wales, and near the mouth of the river Dee. I have occasionally met with a few dead ones near Chorlton, on the sandy hedge backings; as also on the cliff under the castle at Scarborough.

CAROCOLLA LAPICIDA. (*Lamarck.*)

HELIX LAPICIDA. (*Linn.*) Variegated Rock Snail.

" Shell umbilicate, finely granulate, grey or pale rufous, with reddish rays or spots.

"Animal green or blackish-green; neck granular, with two dark streaks; hinder part of the foot yellowish."—*Sturm, t.* 26.

" Shell three quarters of an inch in diameter, finely granulated; volutions five, the outer one sloping on both sides so as to form a sharp edge in the middle of the margin, which runs spirally round the upper volutions, and marks their separation by a fine line; umbilicus central, large and deep; aperture oval, with an indenture or small notch on the inside at the outer pointed extremity where the keel commences; the peristome broad, thin, white, reflected, united and detached all around. Linneus, from some fancy, called this shell Lapicida, or Stone Cutter. This shell is liable to some variation in size and colour. It is rarely pale greenish, nearly transparent; it also varies in the distinctness of the brown marbling."—*Gray, p.* 141.

Found on the limestone walls, between and under the stones at Kilnsey Crag, at Kettlewell, and Buckden, in Yorkshire; and in some parts of Derbyshire, particularly Dove Dale ; also at St. Vincent's Rocks, near Bristol. Abundant.

HELIX SERICEA. (*Müller.*) Silky Snail.

"Shell rather globular, thin, transparent, reddish horn coloured, nearly smooth, or slightly wrinkled, with six whorls thickly set with soft recurved hairs; outer lip thin, without any ribs; umbilicus small.

"Animal greyish, marbled with black. Shell subglobular; three-tenths of an inch in diameter, dark brown, thin, pellucid, with a very obscure whitish central band, giving it a rather keeled appearance; covered with a brown periostraca with distinct elongated hairs; umbilicus rather small (partly covered with the front of the lip), only showing the last whorl but one.

"This shell varies from dull reddish to nearly pure translucid white."—*Gray, p.* 153.

Found near Hebden Bridge, under decayed leaves; at Hough-end Clough, and on the banks of the Irwell, under stones and among the grass.

HELIX HISPIDA. (*Müller.*) Bristly Snail.

"Shell slightly convex, a little carinate, striolate, transparent, horn-coloured; periostraca hairy, with crowded bristles; umbilicus moderate, deep; mouth roundish lunate.

"Animal grey, foot white, thick.

"Shell about a quarter of an inch in breadth, and hardly as much high, horn-coloured, with a slight paler band in the middle of the large volution; periostraca clothed with close fine hairs which are very caducous, under which it is a little striate, but not granular, aperture moderate."—*Gray, p.* 154.

Found at Hough-end Clough, under decayed leaves; in the grass and leaves on most of the hedge backings near Heaton Park, and in Chorlton Fields on the hedge backings.

HELIX CONCINNA. (*Jeffreys.*) Neat Snail.

"Shell rather depressed, slightly keeled, rather shining, reddish brown, concentrically grooved, with scattered deciduous whitish hairs; whorls five or six; mouth roundish lunate, margined; umbilicus broad.

"Animal reddish, very polished; tentacles longish.

"Shell very like the former, but differs in being rather larger, the umbilicus wider, and the hairs further apart, and much more deciduous, which makes it often appear smooth, except near the sutures and umbilicus."—*Gray, p.* 154.

Found near Skipton, in great abundance, on the nettles by the road-side; at Kilnsey Crag, Kettlewell, Buckden, Bolton Abbey, and in nearly every part of Yorkshire, where vegetation and limestone abound.

HELIX DEPILATA. (*Pfeiffer.*) Bald Snail.

"Shell somewhat globular, depressed, pale, bald; whorls rounded, concentrically grooved; mouth lunate; peristome thickened, white; umbilicus moderate.

"This species is very like the former, but quite destitute of hairs in all its stages; it is much smaller in all its parts than any of the varieties of H. RUFESCENS." —*Gray, p.* 155.

Found at Skipton, behind the Castle, under stones and upon plants; at Kilnsey Crag, Kettlewell, and Buckden, on the hedge backings. Not common.

HELIX RUFESCENS. (*Pennant*) Rufous Snail.

"Shell flattish, bald, reddish horn-colour, concentrically striate, slightly carinated by a narrow central paler band; whorls six; mouth roundish lunate; umbilicus large and deep.

"Animal black-grey; upper tentacles thick.

"Shell growing to three quarters of an inch in diameter, but often smaller, semitransparent, varying from pale ash-colour to rufous-brown, often marbled and mottled with paler or darker blotches, rarely pure white, slightly carinated in the middle of the larger volution by a paler band; aperture semielliptic, thin, and slightly reflected, longer than broad. Both the young and old shells are quite bald."—*Gray, p.* 157.

Found at the last-mentioned localities, with H. CONCINNA and H. DEPILATA; also, on the Liverpool-road, near Preston, where they are common; and at Burnley, Gisburn, and Lancaster. They are found also at Roscrea, Tipperary, and on the Banks of the Thames, at Richmond, where they are white.

HELIX FUSCA. (*Montagu.*) Brown Snail.

"Shell subglobose, wrinkled, transparent, very brittle, rather flexible, amber-coloured, bald; aperture lunate; umbilicus very narrow; peristome thin.

"Animal yellowish; tentacles long.

"Shell three-eighths of an inch in diameter, and a quarter of an inch high, very thin and pellucid, more or less wrinkled, glossy amber-coloured; aperture crescent-shaped, very thin, as long as broad, reflected only on the pillar-angle, where there is a minute perforation."—*Gray, p.* 147.

This is found in Hough-end Clough, in the damp and shady parts, where there are plenty of decayed leaves and underwood, but not very abundant; and I have not met with it elsewhere. Thomas Glover, Esq. informs me that it occurs at Gisburn.

This shell is so very thin, that in taking out the animal it is liable to be crushed quite flat; yet, with care, such is its elasticity, that it may be blown up again, and become as perfect as if it had never been disturbed. Several of my specimens have been crushed in this way, but they are now as perfect as when occupied by the animal.

HELIX FULVA. (*Müller.*) Top-shaped Snail.

"Shell rather conic, trochiform, beneath flattish, with six volutions, dark horn-coloured, smooth, and glossy; aperture narrow crescent-shaped; umbilicus minute.

"Animal grey, shining; foot thin; tentacles long.

"Shell the tenth of an inch in diameter, glossy, dark horn-coloured, with six rounded volutions, which are much raised and strongly defined; the base prominent, with a depression in the centre forming an incipient umbilicus; aperture transverse, narrow, as high as broad, with a very thin margin, reflected only near the depression, which, in young shells, is hardly visible."—*Gray, p.* 148.

Found in Heaton Park; under a log of decayed wood, in Mr. Godwin's garden. I have not found it any other locality. Rare.

HELIX ACULEATA. (*Müller.*) Prickly Snail.

"Shell conical, globose, brown horn-colour; with the suture deep; the periostraca rising into thin spinous foliations; aperture semielliptic.

"Animal greenish, tentacles long.

"Shell about the tenth of an inch wide, and as much high, thin, semitransparent, brown horn-coloured; the volutions rounded and deeply separated, clothed with a thin periostraca, which rises into numerous regular rather oblique foliations shooting into points, exhibiting the appearance of a circle of bristles round the middle of each; aperture somewhat orbicular, as long as wide, with a white rib on the side; umbilicus moderately large and deep."—*Gray, p.* 147.

Found about Lancaster, in the woods, under decayed leaves and stones.

ZONITES. (*Montfort.*) ZONITES.

"Animal with an elongate depressed foot, and a large produced central spiral body, curved with (and contractile into) a depressed or hemispherical, thin shell, with flattish spire, and a large lunate mouth, with thin simple lips, which are neither thickened nor reflected; the tentacles are four, the two lower ones small and club-shaped.

"The animal can entirely withdraw itself into the shell, and this genus is at once known from the former by the thinness and generally polished state of the shell, and also by its being depressed and destitute of any internal rib round the edge of the mouth.

ZONITES ROTUNDATUS. (*Gray.*) Radiated Snail.

"Shell flattish, slightly carinate, deeply striate, rufous-grey with chesnut spots.

"Animal pale grey, dotted above; foot short, hyaline; black head, and tentacles blackish."—*Sturm.*

"Shell about a quarter of an inch in diameter, nearly equally convex on both sides, slightly carinate, strongly and regularly striate across, yellowish or reddish-grey with chesnut rays from the centre; aperture semilunar, as wide as long, thin and not reflected; umbilicus large and deep."—*Gray, p.* 165.

Common on the stumps of hawthorn hedges.

In dry weather in the grass, and under decayed leaves in Hough-end Clough; under stones in nearly every situation, and upon all the hedge backings on the roads out of Manchester; it is also found at Burnley and Preston.

Zonites alliarius. (*Gray.*) Garlic Snail.

"Shell nearly flat, slightly globular, thin, transparent, horn-coloured, very shining, nearly smooth; whorls four, underside slightly tinged with opaque white; umbilicus rather large.

"Animal black; tentacles short, cylindric, emitting a strong smell of garlic when irritated.

"Shell about one quarter of an inch in diameter." —*Gray, p.* 168.

In collecting these shells it would save the collector much trouble by smelling at each shell, as the species are so nearly allied. All those that have the scent of garlic, will be the above species. They should, when collected, be kept in separate boxes, and labelled according to their locality, in order that they may be examined at leisure, and with care, by the collector on his return home.

Zonites nitidulus. (*Gray.*) Dull Snail.

"Shell nearly flat, deep yellowish horn-colour, subpellucid, rather strongly wrinkled, of a dull waxy appearance above, more shining below, except near the umbilicus, around which it is of an opaque white; whorls four and a half; umbilicus large, exposing the second whorl.

"Animal dark lead-colour."—*Sturm, t.* 12.

"Shell about three-tenths of an inch in diameter." —*Gray, p.* 172.

Common under stones and amongst any old rubbish that has been lying for some time; on the banks of the Irwell, at Throstle Nest. In the cellar of my own house they are very fine, crawling up and down the walls. Indeed they are to be found in any moist situation, and under decayed leaves. In the woods at Hough-end Clough they are common; also at Preston, Lancaster, &c.

Zonites excavatus. (*Gray.*) Excavated Snail.

"Shell sub-globular, depressed, shining, transparent horn-colour, regularly striated; whorls five and a half or six, rather rounded and closely set; base much rounded, umbilicus very large and deep, exposing all the whorls to the tip; aperture nearly orbicular lunate.

"Animal lead-colour."—*Gray, p.* 175.

Found in Mr. Godwin's garden, under an old log of wood, with Helix fulva. This is the only locality in which I have ever found this shell; like the H. fulva,—rare.

Zonites crystalinus. (*Gray.*) Crystaline Snail.

"Shell flat, glossy, of a greenish crystaline transparency, with six very gradually increasing volutions; aperture semilunate; umbilicus small.

"Animal milky white; neck long, tentacles dark, long, very active.

"Shell, when enclosing the animal, very shining white, fulvous on the spire, hardly the eight of an inch in diameter, flat above and a little convex beneath, with six volutions, which enlarge gradually from the centre; of a crystaline or watery transparency with a slight tinge of green; aperture crescent-shaped; umbilicus deep and rather large. It may be known from the young of any of the former species by its watery transparency, and by the number and regularity of its volutions, which increase in a gradual proportion, not having the outer one much larger than the rest."—*Gray, p.* 176.

Found near Lancaster, in the fields and woods, among the moss and leaves; and at Hough-end Clough, under decayed leaves.

ZONITES PYGMÆUS. (*Gray.*) Pigmy Snail.

"Shell rather convex, pale chocolate brown, semi-transparent; aperture semilunar; umbilicus large.

"Shell half the size of the last, of a pale and hardly transparent brown horn-colour, slightly striate, equally convex on both sides, with the apex usually whitish as if decorticated, with four well-defined volutions; aperture roundish; crescent-shaped, as long as it is wide." *Gray, p.* 167.

Found near Lancaster, inhabiting ditches and wet places, among dead leaves.

PUPA. (*Lamarck.*) Chrysalis Shell.

"Animal, like Bulimus, with four club-shaped tentacles, the lower pair short, small, and with a cylindrical abruptly obtuse shell, with close-pressed, gradually enlarging whorls; the mouth semi-oval, mostly toothed internally; peristome reflexed, and interrupted hehind. These shells are called Pupa, Puppet, or Doll, because they resemble children in their swaddllng-clothes."

Pupa umbilicata. (*Drapernaud.*) Umbilicated Chrysalis Shell.

"Shell cylindrical, bald, smooth, brownish; whorls five to seven; mouth elongate, lunate, with a single laminar tooth united to the upper angle of the outer lip; peristome with a white flat reflected margin; umbilicus narrow.

"Animal granular, head and tentacles black, lower very small; foot whitish."—*Michaud.*

"Shell two lines long, dark horn-colour, glossy, and semitransparent; spire composed of six rounded volutions, finely striate longitudinally; aperture roundish-oval, with a broad, flat, glossy white margin, and a single tooth which is parallel with the margin and close to the outer lip, appearing like a curved continuation of the margin itself; pillar with a large deep perforation behind it."—*Gray, p.* 193.

Found amongst moss, upon walls, and under stones at New Brighton, near Liverpool.

Pupa marginata. (*Drapernaud.*) Margined Chrysalis Shell.

"Shell cylindrical, bald, shining brown; whorls five to seven, convex; mouth roundish-lunate, with a single minute interior central tooth, and a strong white external rib behind the outer lip.

"Animal grey-black.

"Shell the tenth of an inch long, brown or yellowish horn-colour; spire composed of six or seven rounded and slightly striate volutions; aperture semicircular, with generally a small tubercular tooth placed in the middle and deep within the mouth, but which is sometimes very obscure and often totally wanting; peristome thin, not margined, but slightly reflected and forming an umbilicus; and behind the outer lip is a thick white rounded rib.

"This species varies very much in size; and in the compactness of the spire."—*Gray, p.* 196.

Found amongst the grass on the dry waste lands at New Brighton, and on the sandy soils on the same coast, as far as the mouth of the river Dee, where it is common.

CLAUSILIA. Close Shell.

"The animal like Bulimus, but the shell is reversed, with an elongated, slender, fusiform spire, the last volution less tumid than the one before it, with an obtuse or papillary summit; aperture oval, oblique, united all round and margined, toothed; throat furnished with an internal spiral shelly plait, or *clausium,* fixed on an elastic pedicle, which closes the cavity when the animal is withdrawn.

"The elegant spindle-shaped outline of this family having the last volution slenderer than the one above it, and being consequently more tumid above the aperture, fixes its distinction from Bulimus, as well as the peculiarity in the appendage.

"Independently of the various contrivances which nature has resorted to for the protection of the otherwise easily vulnerable Mollusca, it has taken peculiar care to guard the aperture of many univalves from the intrusion of enemies; hence the apertures are sometimes peculiarly contracted and provided with numerous folds and teeth. Other Mollusca have a calcareous operculum permanently formed, which increases in thickness, and enlarges on a depressed spiral plane, as the opening of the shell extends with the growth of the animal, thus continually assimilating to its size, and when the animal retreats, excluding it completely from all external intrusion. In the Clausilia, nature has continued the protection afforded by means of contractions and folds, and also added an opercular appendage. The inhabitant of the Clausilia, when nearly full grown, secretes a thread-like elastic calcareous filament, one of whose ends is affixed to the columella. This filament makes half a spiral turn round the columella, insinuating between its folds. When the animal finishes its shell and completes the aperture, it secretes at the unattached end of the filament, a spoon-shaped calcareous lamina conforming at its margin to the contour of the aperture.

"The lamina is somewhat smaller than this, and its margin is rounded.

"Its adhesion to an elastic filament enables the animal to push it, when it comes out of its shell, against the columella; and the same elasticity closes it, on the inhabitant retreating; thus securing it from intruding enemies. Thus, then, this valve may be compared to a door provided with an elastic spring.

"The elasticity of the filament may be restored to its full power (in the empty shell) by sometimes immersing it in water, as I have ascertained in a section, made with a view to this inquiry." — *Ann. Phil.* iii. 378.

"Of all the wonderful contrivances employed by nature for the protection of the Mollusca, there is none which is more calculated to excite the admiration of the Conchologist than the *clausium*, an elastic appendage which closes the aperture of the Clausiliæ. It consists of a spirally twisted thin shelly plate, inclosed in the last whorl of the shell, and attached to the columella by an elastic pedicle. When the animal is retracted within its shell, this shelly plate nearly covers the aperture at a little distance within the mouth, and coming in contact with a transverse plait on the outer lip, leaves only a small canal, formed between the outer plait and the posterior angle of the mouth, and sometimes an elongated longitudinal plait on the inner lip. When the animal wishes to protrude itself, it pushes the plait on one side into a groove situated between the inner plait and the columella, where it is detained by the pressure of the body of the animal, leaving the aperture free; and when the animal withdraws itself, the plait springs forward by the elasticity of its pedicle, and closes the aperture.

"This curious structure, and also the plaits of the mouth, which are intimately connected with it, are not formed until the animal has nearly reached maturity.

"It is best exhibited by breaking off the outer part of the aperture to the distance of about half a whorl, when it will generally be found free; but in order to exhibit it behind the columella in its natural position, when the animal is exserted, it is necessary to kill the animal in that situation (by drowning it), and then suffer it to dry before the outer lip is broken off, and the pedicle will thus become fastened to the side by means of the dried mucous (of the body); it may, however, at any time be relaxed by a little moisture, when it will instantly resume its elasticity, and spring from its attachment."

CLAUSILIA BIDENS. (*Drapernaud.*) Laminated close Shell.

"Shell nearly smooth, glossy, and transparent; aperture with two white plaits, clausium emarginate.

"Animal pale fluvous; upper tentacles, long, clavate, —*Sturm, Fauna.*

" Shell half an inch long, of a glossy reddish brown colour and nearly smooth; spire composed of twelve raised volutions; aperture roundish-oval with a white thick margin, attached at the upper part of the body volution, with two laminar folds, one of them straight and placed near the top of the aperture and almost central, the other, curved, and in the middle of the pillar lip, frequently crenate; and deep within the mouth are three or four permanent ridges which are visible on the back at the outside when held before a strong light. Varies greatly in size, ventricoseness, and colour, being sometimes greenish-white and transparent."—*Gray, p.* 202.

Found in the woods near Bolton Abbey, and at Gisburn, in Yorkshire. In wet weather it is seen crawling up the trees, and in dry weather it is concealed at the roots of trees, under stones, and amongst moss and grass.

CLAUSILIA DUBIA. (*Drapernaud.*) Doubtful close Shell.

" Shell dark brown, rather ventricose, with strong raised striæ, rendered somewhat granular by a few spiral ridges on the lower whorls; whorls ten or twelve, a little roundish; aperture with two teeth on the pillar, the lower one forked internally; peristome whole, detached, and reflexed.

"This shell is about five-eighths of an inch long, and one-eighth broad."—*Gray, p.* 216.

Found near Bolton Abbey, on the trees; at Skipton, behind the Castle; Kilnsey Crag; Kettlewell; and Buckden; on the lime-stone rocks, old walls, and on the trunks of trees in the woods. Common.

CLUASILIA NIGRICANS. (*Jeffreys.*) Dark close Shell.

"Shell slender, sub-opaque, black-brown, with fine raised somewhat granular striæ; aperture with three plaits, the margin white and detached all round.

"Animal brown, corrugated, foot narrow.

"Shell about half an inch long, glossy black or grey, often marked with short cinereous streaks, with regular raised lines, which, when closely examined, appear a little granular; spire composed of from seven to ten, rather raised volutions; aperture oval, with the inner lip a little contracted, with three plaits all on the pillar, the lower one interior, and hardly distinguishable in the full-grown shells; the margin thick and white, but not reflected, detached all round."—*Gray, p.* 217.

This shell abounds on stone walls, on the trunks of trees, under stones, and in moss in the woods at Buckden, Kettlewell, and Kilnsey Crag. It is also found at Skipton, near the Castle, and at the Brushes, near Stalybridge, upon the stone walls and in the moss.

BULIMUS. Twist Shell.

"The animal is moderately large (like the snails), with four tentacles, a small elongate foot, and a long central, slender, spiral body, covered with an oblong shell; the spire produced and ending rather acutely, with the ultimate volution larger than the next; aperture oval, entire at the base, without teeth, not half as long as the spire; the peristome interrupted; outer lip generally thickened, reflexed.

"The shell of this genus is distinguished from that of Linneus in wanting the oblique fold on the pillar; from the Clausilia in being regular, and in having the peristome simple and interrupted; and from the Pupæ in having the spire regularly tapering.

BULIMUS ACUTUS. (*Brugière.*) Banded Twist Shell.

"Shell oblong, rather acute, coarsely wrinkled, or striate, generally whitish, with brown streaks or bands.

"Animal pale yellowish; upper tentacles long, subulate, lower very short.

"Shell half an inch or rather more in length, and about a third as much broad, oblong, semitransparent, variously marked, but always coarsely wrinkled longitudinally, and sometimes of a greyish colour with white longitudinal streaks; spire consisting of from nine to twelve somewhat rounded volutions, ending rather acutely; aperture oval, longer than wide; the peristome reflected and forming a slight perforation at the pillar.

"This shell varies very greatly in its colour, being sometimes nearly white without bands, and at others variously banded; the hinder bands are often wanting or interrupted, and sometimes instead of being banded the shell is marked with oblique longitudinal streaks, sometimes the black and sometimes the white being the more abundant, and consequently forming the ground colour. It varies slightly in shape, and is sometimes elongated."—*Gray*, *p.* 185.

Very common on the sand-hills on the North coast of Wales, amongst the grass ; and is in great abundance on the sand-hills near the mouth of the river Dee. It is very fine at Tenby ; also between Diganwy and the Ormes Head, and near Llandidno, on the coast.

BULIMUS OBSCURUS. (*Drapernaud.*) Dusky Twist Shell.

"Shell oval-oblong, brown, with the peristome white and reflected, forming a small umbilicus.

"Animal rosy-grey; foot thick, paler; upper tentacles subulate.

"Shell half an inch long, and about a third as much broad, brown or horn colour, semitransparent; spire composed of six or seven raised volutions, slightly striate longitudinally; aperture oblong-oval, with the margin white and reflected, forming a slight umbilicus behind the pillar. The young shell conical, pyramidical, with a subquadrangular mouth.

Found near Gisburn, and at Dudley, in the lime-stone district; also under the stones and the moss in woods; and upon old walls.

ZUA. (*Leach.*) Varnished Shell.

"Animal like Bulimus, with an ovate subcylindrical rather blunt shell, covered with a smooth polished periostraca; mouth ovate, thickened, and united all round; peristome toothless; axis imperforated.

"This genus is easily known from Bulimus by the polished periostraca and continued, thickened, not reflexed lip; and from Azeca by the simple peristome.

ZUA LUBRICA. (*Leach.*) Common Varnished Shell.

"Shell cylindrical oblong, quite smooth, glossy, and semitransparent; the peristome thick, without umbilicus.

"Shell hardly a quarter of an inch long, and a third of its length broad, of a glossy brown or horn-colour, with often a reddish tinge, quite smooth and polished; spire composed of five or six raised volutions; aperture narrow-oval, with the margin thick and not reflected, often of a rosy colour.

"Varies in shape, size, and colour, sometimes transparent greenish white."—*Gray, p.* 188.

Found amongst the grass and moss upon the hedge backings, on the Droylesden Road; on the banks of the Irwell, under the stones; upon most of the hedge backings in Chorlton Fields, and upon the Middleton Road, under the fences between White Smithy Bar and Heaton Park.

Some seven years ago, I was collecting some of these beautiful little shells, in the last mentioned locality, and when busily engaged in turning over the stones and moss, I was accosted by a lady and gentlemen, Mr. Michael Delauney and Miss Delauney, of Crumpsall. They enquired what I was seeking for. To their astonishment, I handed them a small box filled with shells of various kinds, all found in that neighbourhood. They observed, they were not aware that shells so beautiful were to be found so near at hand. While we were conversing together, up came a cart, which made such a noise upon the stones as to start a weasel from the hedge near us. Of course we all gave chase, and the carter caught him. This led to further conversation. Mr. Delauney very handsomely gave me permission to go all over his grounds at Blackley and Crumpsall; and ever since that time, I have, on visiting him, been kindly entertained under his hospitable roof, and always had free access to his somewhat extensive grounds. Had I the ability, I would here place on record a tribute of heartfelt commendation to him, worthy of that interest he has ever manifested in forwarding the study of Natural History in all its branches.

AZECA. (*Leach.*) Trident Shell.

"Animal like Bulimus, with subcylindrical, rather obtuse shell, covered with a polished periostraca; aperture pear-shaped, curved and pointed at the top; the margin thick, obtuse, and united all round and toothed; the axis imperforated.

"In shape, colour, polish and habitat, this shell so exactly resembles the Bulimus lubricus, that some have questioned if this latter shell be not the same in its earlier stage of formation, before the teeth appear; but the singular shape of the aperture decidedly removes it into a distinct genus, which is adopted from Dr. Leach.

Azeca tridens. (*Leach.*) Glossy Trident Shell.

"Animal brownish black, shining; upper tentacles cylindrical, club-shaped.

"Shell two-tenths of an inch long, and a third part as broad, oblong or conico-cylindrical, brown horn-colour, semitransparent, quite smooth and glossy, except close to the sutures, where there appear some fine longitudinal striæ; spire composed of seven flat and hardly raised volutions; aperture pear-shaped, curved, and narrow at the upper and outer angle; the peristome thickened and obtuse.

"This shell varies in shape, size, and colour, being sometimes transparent greenish white, from want of substance and colouring-matter. It also varies in having one or two additional small teeth in the peristome alternately with the large ones."—*Gray. p.* 189.

Found near Gisburn, particularly in the woods connected with the park, under the moss, among decayed leaves, and in the thick shady places.

Bolœa. Moss Shell.

"The animal is like Bulimus, but the shell is reversed, thin, with an elongated taper spire, the last volution larger than the next; aperture roundish-oval, entire at the base, oblique, with a single tooth on the pillar, which is wanting in the young shells, and the pillar is destitute of any valve-like plait or clausium.

"This shell is often mistaken for a young unformed specimen of Clausilia, but it may be known from those shells by the front of the last whorl being convex and simple, and not flattened and furnished with a keeled ridge near the outer edge, as is the case with the young of all the species of that genus.

"From Bulimus and Pupa this genus is distinguished by the aperture being left-handed; from Clausilia, in having the ultimate volution proportionately larger than the next; and from Vertigo, in the regularity of its mouth.

Bolœa perversa. (*Fleming.*) Fragile Moss Shell.

"Shell rather linear-oval, transparent yellowish; whorls six or seven; mouth subquadrate.

"Animal brownish-yellow; neck black; foot grey, granular, spotted, narrow, and elongate; tentacles, upper thick, short, clavate; lower scarcely visible, very small, tubercular; muzzle very blunt and large.

"Shell about a quarter of an inch long, slender, and tapering to a rather sharp point, transparent yellowish horn-colour, slightly striate longitudinally; spire consisting of from six to nine raised and well-defined volutions; aperture roundish-oval; the peristome thin, simple, and a little reflected at the pillar so as to form a slight umbilicus. In old and full-grown shells there may be observed a slight fold or tooth about the middle of the pillar, but which is seldom to be met with."—*Gray, p.* 207.

Common in the orchards, upon apple trees, all about Freckleton, near the river Ribble; also upon the willows in the garden at Naze House, in the same neighbourhood, now belonging to Mr. Myers, a few miles from Lytham.

Succinea. (*Drapernaud.*) Amber Snail.

"The animal with a large gelatinous foot, short inflated tentacles, and an oblong spiral body, lying on the upper part of the foot; body covered with an oval, oblong, thin shell, with a short conical spire, and rapidly enlarging whorls, ending in a large longitudinal oblique mouth, with the peristome disunited behind; pillar smooth, and with an imperforated axis.

"This genus is easily known from *Helix* and *Zonites* by the oblong shape; and from *Lymnæus,* with which the older Conchologists often confounded it, by there being no appearance of any oblique fold on the pillar.

"Montagu justly observes, that the animal, like the other *Limaces*, possessing four tentacula, is hermaphrodite, and sometimes unites as late as the month of August."—*Test. Brit.* 398, and *Sup.* 139.

It is so named from the transparent amber colour of its shell.

Succinea putris. (*Fleming.*) Common Amber Snail.

"Shell oblong-oval, smooth, glossy and transparent, reddish amber-colour; whorls three; aperture oblong-oval.

"Animal grey, spotted; tentacles rugose.

"Shell, when containing the animal, blue-black; about three quarters of an inch long, and half as much broad, of a greenish, amber or orange-yellow colour, very thin and transparent; spire composed of three volutions, the first extremely large and inclining a little obliquely; the two upper ones very small, and ending rather obtusely; aperture covering three-fourths of the shell; pillar spiral, visible internally to the end or apex."—*Gray, p.* 178.

Found in Hough-end Clough, in the damp parts, crawling up the plants. There are several old pits grown over with weeds in the same locality where it abounds. I have sometimes taken a dozen from the borders of one pit. This shell varies very considerably, both in size and colour. One of its varieties is Succinea amphibia. *(Drapernaud.)* Several varieties are found on the banks of the Mersey, at Jackson's-boat, one of which is Succinea gracilis, *(Alder.)* In a wood, nearly a mile from Eccles, about a field's breadth from the road, on the left-hand side in going from Manchester, is found a variety nearly as clear as glass.

Succinea Pfeifferi. (*Rosm.*) Slender Amber Snail.

"Shell oblong, transparent, shining, internally pearly; mouth very large, elongate-acute, very oblique, outer lip thin."—*Gray, p.* 178.

Found near Kettlewell, in Yorkshire; on the banks of Arncliffe Beck, on the stones covered with moisture.

FAMILY. AURICULIDÆ. (*Gray.*)

CARYCHIUM. (*Müller.*) Carychium.

" Shell spiral, thin conic-ovate; mouth oblong, longitudinal, two or three-toothed, compressed, rather oblique, rounded at each end; peristome interrupted, thickened, and rather reflexed.

" The animal is yellowish-white, with only two short cylindrical, blunt, or truncated tentacles, at the base of which, between, or nearly behind them, are placed two very conspicuous approximating black eyes.

" Shell hardly the tenth of an inch long, conic, white, shining, with a yellowish cast, transparent; spire composed of five rounded volutions, very finely striate longitudinally, and ending rather obtusely; aperture semioval or rather ear-shaped, rounded at both the ends, with two teeth on the pillar, and sometimes a small one above the others; the margin thick, and in the middle of the outer lip a thick tooth-like protuberance."—*Gray, p.* 221.

Found in the moss and grass on the walls of the Castle, at Carlisle, near the foundation.

PLANORBIS. Coil Shell.

" The animal with a small foot; tentacles with an auricle at the base, and a long slender subcentral spiral body, which is covered with an external discoidal dextral shell, the whorls rolling nearly on the same plane; with a lunate or subquadrate mouth, and a simple cavity.

" In considering these shells as sinistral, the spire is that side which is uppermost when the mouth is placed on the right side of the spectator, with the most expanded part of the outer lip downwards.

" It is improper to observe this distinction, for Dr. Turton and others, in describing the species, have sometimes called the under side the upper, and *vice versa*.

" This genus is so named from the flattened and horizontal coil of the volutions, by means of which the whole of the gyrations may be seen on each of the sides.

PLANORBIS CARINATUS. (*Müller.*) Carinated Coil Shell.

" Shell horn-colour, transparent, striate, nearly flat above, rather convex, and with a slight central umbilicus beneath; whorls six, rapidly enlarging, with a prominent obtuse keel in the middle; mouth angular.

" Animal brown.

" The animal, according to Montagu, differs from P. MARGINATUS in the tentacles being somewhat longer, and particularly in their being pellucid, yellow, and not darker in the middle.—(T. B. 453; *Sturm*, *t.* 43.)

" Shell hardly half an inch in diameter, with five volutions, the outer one growing suddenly larger, above nearly flat, beneath rather convex, gradually shelving to the outer edge; in the older specimens, the hinder or upper part of the whorls become rather convex; colour pale horn-colour and transparent, often covered with a brownish coat; aperture contracted to a point above, in consequence of the keel." —*Gray, p.* 262.

Found in the weeds and floating on the water of an old pitstead, close to Mr. Andrew's print works, Harpurhey; in the Nine-pits, Chorlton Fields; and behind the Bull and Punch-bowl. It is common in many ponds all about Manchester.

PLANORBIS MARGINATUS. (*Drapernaud.*) Margined Coil Shell.

"Shell horn-colour, brown, semitransparent, striolate, flat or a little concave above, flattish, with a slight central concavity, beneath; whorls rapidly enlarging, flat, and strongly keeled above, ventricose and rounded to the margin beneath.

"Shell about three-quarters of an inch in diameter, very like the last, but thicker and the whorls more rounded, more convex to the edge beneath, and flatter at top or behind; hence the keel has been called marginal, and the mouth is more rhombic and rounded in front; these characters are quite as visible in the young shells. The keel greatly varies in distinctness and prominence, but is never so prominent as in the former species."—*Gray, p.* 265.

Found in most of the pits, on the weeds, in Chorlton Fields; behind the Bull and Punch-bowl, where it is common. In the pits on the road-side of this neighbourhood there are some very fine specimens, and also in some ponds about Cheetwood.

Planorbis vortex. (*Müller.*) Whorl Coil Shell.

"Shell brown, pellucid, thin, flat above, slightly and regularly concave beneath, with six or seven gradually increasing sharply keeled volutions, which are convex before and flat behind; mouth rhombic, compressed.

"Animal violet-brown.

"Shell three-eighths of an inch in diameter, very flat and thin, with six or seven gradually increasing volutions, slightly concave above, and quite flattened underneath, so as to form a sharp edge round the outer volution; aperture a little angular.

"In summer, when the ditches are dry, this animal closes up its shell with a white *epiphragm,* within which it lies secure under the mud and weed, in a state of torpidity, until the ditches are again filled with water. The animal then thickens the internal margin of the shell, forming a permanent white rim."—*Gray, p.* 267.

There is scarcely a pit in Chorlton Fields that does not contain this species, among its weeds; and the same may be said of other pits in almost every direction out of Manchester. It is common, too, in the ditches on Freckleton Marsh.

PLANORBIS SPIRORBIS. (*Müller.*) Rolled Coil Shell.

"Shell thin, brown, slightly concave on both sides, with gradually increasing roundish and nearly equal volutions; mouth roundish.

"Shell in flatness and compactness of volutions much resembling P. VORTEX, but is less, and has only six volutions; is rather thicker; the upper surface is a little concave in consequence of the volutions being rounded, and the outer one scarcely flattened into a carinated edge; and the aperture is rounded below."—*Gray, p.* 268.

This species is so much like P. VORTEX that it is not easy to distinguish the two. They are found in nearly all the old pits behind Stockport, and near Cheadle ; also in the ditches of Moss-lane, Greenheys ; and in the neighbouring pits of Heywood's farm ; in all which localities they are very clean. They abound on the weeds, and may easily be taken by agitating the water with a stick, which is sure to disturb the shells and cause them to float on the surface. In Hough-end Clough this species is also found, but it does not quite so well answer the description above given, as those of Cheadle, Moss-lane, &c.

PLANORBIS IMBRICATUS. (*Müller.*) Nautilus Coil Shell.

"Shell depressed, thin, pellucid, rather concave above, flattish beneath; whorls depressed, obtusely keeled, with spinous ridges across the outer whorl; aperture oval, united all round.

"Animal grey.

"Shell the tenth of an inch in diameter, of a blackish or greenish horn-colour, with three volutions; the epidermis raised into numerous transverse ridges, which form a spinous crest round the outer margin; aperture roundish-oval, united all round, and often detached from the second volution at its narrow end." —*Gray, p.* 161.

Found in most of the old pits on the coast, from Ormskirk to Southport and Preston. Also near Hebden Bridge, in the old pits, on the weeds; and in the ponds about Freckleton, where, in a very small pond at Naze House, near the kitchen garden, they are particularly fine and clean.

PLANORBIS CONTORTUS. (*Müller.*) Twisted Coil Shell.

"Shell deeply umbilicate above, nearly flat beneath; whorls eight, convex; suture deep; aperture very narrow crescent-shaped.

"Animal grey or blackish."—*Sturm, t.* 41.

"Shell about two-tenths of an inch in diameter, and one-tenth in thickness, brown horn-colour, and when free from accidental incrustations, exhibiting in water a bronzed or gilt lustre; volutions five, remarkably compact and equal in size; the upper surface with a large and deep umbilicus; aperture very narrow crescent-shaped, wider than high, only slightly produced on the under side."—*Gray, p.* 270.

Found in a ditch at Preston, which runs zigzag under the first southern railway bridge, and between Jackson's orchard and Fishergate-lane. Also in a ditch near Warton, about two or three fields distance from Mrs. Penketh's house, on the road leading to Naze, where they are abundant.

PLANORBIS ALBUS. (*Müller.*) White Coil Shell.

" Shell thin, pellucid, white, concave, and with the whorls equally convex on both sides, with five raised hisped spiral striæ; mouth roundish rhombic.

"Animal greyish."—*Sturm t.* 42.

" Shell about a quarter of an inch in diameter, very thin and brittle, pale horn-colour, marked with very fine close-set raised circular striæ, which are clothed with deciduous bristles, and crossed with obscure longitudinal lines; volutions five, the first very large and rounded; the upper surface a little sunk in the middle, the under side more strongly concave; aperture roundish-oval, dilated, higher than wide, with the upper angle much produced."—*Gray.*

Found in the ponds in Prestwich wood, on the leaves of *Nymphada Alba.*

SEGMENTINA. (*Fleming.*) Segment Shell.

"Animal nearly like Planorbis, but the shell is polished, and the cavity contracted by permanent transverse ridges, having a triradiated opening.

" So called from the internal segments or partitions.

Segmentina lineata. (*Fleming.*) Glossy Segment Shell.

"Shell hardly a quarter of an inch in diameter, highly polished and smooth, of a chesnut or reddish brown colour, flattish and semitransparent; volutions four, the outer one very large in proportion, and marked with two or three whitish transverse lines exhibiting the internal partitions; the upper surface very convex, with a deep umbilicus in the centre, the underside nearly flat, and umbilicate in the centre; the circumference slightly carinate; aperture oval, inclining to triangular, with the peristome interrupted." —*Gray, p.* 272.

Found in the ponds near Blackpool, amongst weed and on the mud.

Physa. Bubble Shell.

"The body spiral, on the middle of an elongate foot; the mantle large, lobed on the edge, and expanded over the ovate, thin, transparent spiral, sinistral shell, which has an oblong mouth, with the inner lip expanded and spread over the body whorl, covering the axis and the smooth pillar; the tentacles have an auricle at the base.

PHYSA FONTINALIS. (*Drapernaud.*) Stream Bubble Shell.

"Shell horn-colour, oval, with a very short obtuse spire; aperture dilated at the base.

"Animal blackish-grey; tentacles paler.

"Shell nearly half an inch long, and half as much broad, very thin and fragile; spire extremely short, of four volutions, the lower much inflated, the others small and ending obtusely; aperture covering nearly the whole of the shell; pillar slightly sinuate and white, not reflected."—*Gray.*

Found in the pits behind the Bull and Punch-bowl, upon the rushes, generally some four or five inches below the surface of the water ; in the ponds on Baguley-moor. Also very fine at Moss Mill, Dean-lane, Newton Heath, at the bottom of the hill close to the Leeds Railway bridge (at the Failsworth end) in a gote, or water, which supplies the works ; and in the pits on Heywood's farm, Moss-side, Moss-lane. Likewise equally fine in the ponds near Liverpool, on the Cheshire side, a mile or two from the coast.

APLEXUS. (*Fleming.*) Aplexus.

"Animal exactly like Physa, but the mantle edge is simple and not reflected over the shell, and the tentacles are without any auricle at the base; the shell is longer, and the inner lip is parallel to the outer, and not spread over the body whorl.

APLEXUS HYPNORUM. (*Gray.*) Slender Aplexus.

" Shell horn-colour, oblong, with an elongate pointed spire; aperture oval-lanceolate.

"Animal blackish; foot quite as long as the shell; tentacles black.

" Shell half an inch long, and a third part as broad, dark horn-colour, glossy and transparent; spire composed of five or six produced and hardly raised volutions, ending rather acutely; aperture narrow-oval, covering about half the shell; the pillar a little sinuate, often of a pale rose-colour."—*Gray, p.*

Found in the ditches of Moss-lane, Greenheys, and in holes in the adjoining fields; common in an old pitstead on the left hand side of the new road from Ardwick leading to Gorton. This pitstead is half filled with clay, and cannot be well missed. By carefully disturbing the weeds, the shells will float on the top of the water. In this pitstead, many other species are found.

Lymnæus. Mud Shell.

"Animal with a short broad foot, broad short, compressed tentacles, without any auricles at the base, a large central spiral body, and a simple-edge mantle, covered by an external ovate, thin, dextral, transparent spiral shell, with an ovate mouth, having a single oblique plait on the middle of the column running into the axis.

"This genus is known from Amphipeplea and Physa, by the edge of the mantle not being produced so as to cover the shell, and by the inner lip not being extended over the body whorl of the shell. It is known from Aplexus by the shell being dextral, and having the pillar-plait; the latter character, and their great solidity, will distinguish even the reversed monstrosities of these shells from that genus.

Lymnea Stagnalis. (*Drapernaud.*) Lake Mud Shell.

"Shell oval, subulate, pointed, brittle; spire acute; whorls five; lower volutions much inflated, and somewhat angular; the suture deep.

"Animal yellowish, paler beneath."—*Sturm, t.* 34, 35.

"Shell an inch and a half long, and nearly an inch wide, thin and brittle, of a greyish colour, often covered with an extraneous coat; spire composed of six or seven volutions, which are rounded and tumid, tapering to a fine point; the larger one striate longitudinally, and generally crossed by raised transverse lines, giving it an angular appearance like cut-glass; pillar with the fold very strong, forming a slight umbilicus, the lip white and spread."—*Gray, p.* 236.

There are five or six pits close to the Beswick Water Works, each of which contains a distinct variety of this shell: one variety has a reddish purple pillar, and is very large. I have not seen this variety elsewhere. The other varieties, however, are common in most of the pits between Ashton and Manchester. There is a pit on the left-hand side of the high-road from Ardwick to Gorton, that contains a shell which answers well to the above description, having a cut-glass-like appearance. At Moss Mill, Dean-lane, Newton Heath, at the bottom of the hill, near the railway bridge, and at the Failsworth end of the gote that supplies the works, it is very fine and large; also, in the ponds about Formby.

LYMNEA AURICULARIUS. (*Drapernaud.*) Wide Mouthed Mud Shell.

"Shell extremely inflated, striolate, with a very short acute spire; aperture oblique, vastly expanded and roundish-oval.

"Animal dull greenish-yellow; tentacles speckled with brighter spots."—*Sturm*, *t.* 38.

"Shell an inch long, and three quarters wide, thin, brittle, transparent, of a light yellow horn-colour, more or less distinctly striate longitudinally; spire composed of four volutions, the three terminal ones very small; aperture vast, somewhat oval, with the outer lip expanded; pillar with a strong fold, the lip reflected and forming a slight hollow behind."—*Gray*, *p.* 232.

Found very fine upon the stones in Beswick Water Works reservoir; and in some pits in Dirty-lane, Cheetham; also in some of the pits behind Ardwick Station, and near the Borough Jail; and in most of the pits and lodges in the hollows near Newton. In the Leeds and Liverpool Canal, at Burnley, it is very fine. In some pits near Lancaster, it is of a very elegant shape, far surpassing any found elsewhere. This shell is common and variable.

LYMNEA PEREGER. (*Drapernaud.*) Puddle Mud Shell.

" Shell ventricose, more or less striate, with a moderately short acute spire.

"Animal olive, yellow spotted."—*Sturm, t.* 39.

" Shell varying very much in size, of a greyish or yellowish colour, more or less concentrically striated; spire moderately elongated, about a third part the length of the whole shell, with the lesser volutions not so abruptly disproportionate to the body one as in the former; aperture oval-oblong, with the umbilicus obliterated. The shells are often covered with a calcareous fur or deposit, which nearly hides them, and which has been sometimes mistaken for periostraca."—*Gray, p.* 233.

This shell may be distinguished from LYMNEA AURICULARIUS by being not so much reflected in the lip. It never grows quite so large as that species, and is generally covered with a calcareous deposit. Nearly every clay-pit in Cheetham has a distinct variety; and there is scarcely a sheet of water anywhere that does not contain it. In Mr. Delauney's waters at Blackley and Crumpsall, it is very fine; and in all the pits in Chorlton Fields; in Beswick

Water Works; at Reddish, Gorton, and Droylesden, it is common.

In Dallam-brook, near Warrington, occurs a variety of a reddish-brown, with highly raised striæ. This, however, may turn out to be a new species.

Lymnea palustris. (*Drapernaud.*) Marsh Mud Shell.

"Shell conic-oval, with six rather tumid volutions, the lower one somewhat angular by raised transverse and longitudinal striæ; mouth ovate; throat brown or violet.

"Animal yellow-brown or cinereous, speckled with lighter colour.

"Shell three quarters of an inch long, brown horn-colour, rather opaque, suddenly sloping in a conic manner, the volutions hardly raised, slightly striate longitudinally, and crossed with more transverse ones, like the facets of cut-glass; aperture oval, covering nearly half the shell, often chocolate-brown and glossy in the inside, sometimes rosy about the pillar, where the peristome is spread and glossy, forming a single umbilicus."—*Gray, p.* 239.

Found upon the weeds in the pits behind the Bull and Punch-bowl; in the pits on the road-side near Chorlton, and in those near Beswick Water Works; and in most of the old pitsteads in Chorlton Fields. It is also common in the neighbourhood of Preston.

LYMNEA TRUNCATULUS. (*Jeffreys.*) Ditch Mud Shell.

"Shell oblong-oval, pointed, brittle, perforated, with six or seven rounded and deeply divided volutions, striolate longitudinally and across; mouth ovate-oblong.

"Animal greyish or dusky.

"Shell half an inch long, pale brown or greyish, and is readily distinguished from the last by the rounded and deeply divided volutions; aperture nearly half as long as the shell, the outer lip a little reflected but not spread nor glossy.

"These animals are extremely variable in size and colour, according to the locality in which they are found, and the abundance of their food. Mr. Alder observes, that a variety of a much smaller size is found on the margins of rivers; and another is found in mountain streams."—*Gray, p.* 241.

Found in the clay pits on the Cheetham Hill road, near the Catholic Chapel; and in the ditches and shallow waters, near Beswick Water Works. It is common, too, at Lytham.

Lymneus glaber. (*Gray.*) Eight Whorled Mud Shell.

"Shell elongated, oblong-cylindrical, tapering, brittle, pellucid, yellowish-white, with seven or eight convex volutions, and the aperture elongate-ovate.

"Animal black or dusky.

"Shell an inch long, regularly tapering, with the ultimate volution not larger in proportion than the rest; spire composed of seven or eight tumid volutions; on the larger of which are often a few transverse striæ, and all of them obscurely striate longitudinally; aperture narrow-oval, not a third part as long as the spire, with the pillar spread and white, but not forming an umbilicus.

"It varies in the convexity of the volutions, and their numbers, as we have them from different waters from six to nine.

"This animal, like the other species, but perhaps more frequently, forms a thick white internal rib to the outer lip, just within the edge."—*Gray, p.* 242.

Inhabits the famous old pitstead on the new road from Ardwick to Gorton. Common in the ditches of Moss-lane, and in holes in the adjoining fields. Also, near Liverpool.

Family Peristomata. (*Lamarck.*)

Valvata. (*Müller.*) Valve Shell.

"Shell with the spire a little elevated, or flat and disk-like; aperture quite circular, united all round, and furnished with a horny operculum marked with a single raised spiral membranaceous line. So named from the valve or lid which covers the orifice of the aperture.

Valvata picinalis. (*Lamarck.*) Stream Valve Shell.

"Shell globular, with an elevated obtuse spire, and a deep central umbilicus.

"Animal whitish; trunk grey rugose.

"Shell a quarter of an inch long and as much broad, globular, thin, light horn-colour, very finely spiral-striate, and marked with some obscure concentric lines; spire of four volutions, tumid and deeply defined, and having much the appearance of a Trochus, with a deep central umbilicus; operculum dull greyish white."—*Gray, p.* 97.

Very common in the main drains of the marsh behind Southport, distant about a mile from the town; in the ponds at Freckleton; at the entrance of the marsh; in the neighbourhood of Burnley, and particularly in the lodge at Margerison's print works, upon the leaves of the *Striatiotes.*

VALVATA CRISTATA. (*Müller.*) Crested Valve Shell.

"Shell discoided, flat above, and umbilicate beneath; whorls three.

"Shell about the tenth of an inch in diameter, pale horn-colour, striate transversely, with three volutions; the upper surface a little sunk, the underside umbilicate, so as to expose the interior volutions."—*Gray.*

Found in the aquatic plants near Gisburn; in the ditches, ponds and canals.

PALUDINA. (*Lamarck*) Marsh Shell.

"Operculum horny, the nucleus rather on the inner side; shell conoid or oblong; mouth roundish, slightly angular behind; peristome united all round, thin.

"They are called Paludina from their being found in marshes and ditches.

"The animals are viviparous, the young being hatched while the eggs are in the oviduct of the mother.

"The shells of the newly-hatched individuals are covered with spiral bands of cilia.

PALUDINA VIVIPARA. (*Linn.*) Crystaline Marsh Shell.

"Shell thin, oval, acute, volutions five, much inflated, with three brown bands; the suture deeply impressed; spire blunt mucronate.

"Shell an inch and a quarter long, and an inch broad, thin, transparent, finely striate longitudinally, of an olive colour, with three brown bands on the larger volution; spire composed of five inflated and deeply divided volutions, the last very large, the first a mere point; aperture pear-shaped, a little produced at the upper angle; the inner lip a little reflected so as to half-close the umbilicus. The young shells are subglobose, pellucid, obscurely banded, rather flattened above, and furnished with five ciliated lines."—*G. p.* 90.

Very common in the main drains of the marsh in the Scarisbrick-road, near Southport. This is the nearest locality in which it is found, so far as my researches go.

Bithinia. (*Gray.*) Bithinia.

"Operculum lined internally with a thick shelly coat; nucleus subcentral; the mouth of the shell ovate, continued, rather angular behind, with a slight thickened internal rib.

"These animals are oviparous, their eggs being deposited in oblong groups, like the Laminæi or Pond Snails, on the stems and leaves of fresh water plants.

Bithinia tentaculata. (*Gray.*) Tentacled Bithinia.

"Shell oval-oblong, yellowish horn-colour, smooth, semitransparent, with five rather flat volutions, and without umbilicus.

"Animal blackish, with golden dots; foot two-lobed in front, narrow and subacute behind; tentacles setaceous, long; the eyes black.

"Shell half an inch long, and three-tenths wide, often covered with a blackish foul coat; spire composed of five volutions, the first very tumid, the others hardly raised; pillar without umbilicus."—*Gray, p.* 93.

Found in two pits on the right-hand side of Chorlton-lane, about one hundred yards from Mr. Crewdson's house, on the opposite side, one field's breadth from the lane, entering at the gate about three hundred yards from the end of Chorlton-road, after leaving Stretford-road; and in the pits on Heywood's farm, Moss-side, Moss-lane. It is found in thousands in the main drains, near Southport; and in the ditches on Freckleton Marsh, where the specimens, in both places, are very fine and clean.

The following is from a scientific correspondent residing near the spot described, and is well deserving of insertion :—

"Haweswater, or Hazewater, is a small lake or tarn situate in the township of Silverdale, in the parish of Warton, in the county of Lancaster. Its extent is about twelve acres, and its depth varies from thirty to fifty feet. The water is very clear and without any admixture of sea-water. The shells thrown up at the north side of the tarn are all *dead*, without epidermis, but perfect in form, and purely white; and there can be little doubt that living specimens exist in vast numbers at the bottom of the water. The tarn is surrounded on all sides, except the north, by peat-bog, which rests on a layer of shells from two to three feet thick. A vertical ridge of rock forms the northern boundary of the tarn, having a sloping beach formed principally of the *detritus* of the shell in question. The rocks of the district consist entirely of mountain limestone, with the usual veins of iron and copper, and with some traces of old red sandstone.

"There is a smaller tarn very near, called

Little Hazewater, very deep, but containing very few shells. The people in the neighbourhood use the shells for strewing on flagged floors, instead of sand; and the deeper layers, which are finely pulverised, are used instead of lime for whitewashing, being a very pure white.

"A more extensive deposit of the shell is to be seen on the Burton and Yealand Mosses, through the centre of which the Milnthorpe turnpike-road passes. The extent of this morass is two or three hundred acres, a great portion of which rests on a thick layer of shells, many of them unbroken, but all without epidermis, and all purely white."—J. WALLING.

FAMILY NERITACEA. (*Lamarck.*)

NERITINA. (*Lamarck.*) Neritine.

"Shell half-ovate, thin; inner lip slightly toothed; column only slightly calcareous, and furnished with a sharp flexible outer edge; foot short, rounded at each end.

"This genus is separated from the marine Nerita by the pillar being sharp, only slightly denticulated, and the outer lip not being toothed within.

Neritina fluviatilis. (*Lamarck.*) River Neritine.

"Shell convex, dilated, tesselate, with variously coloured spots; spire short, lateral.

"Animal white; head and back of the neck blackish; hinder part of the foot sometimes black spotted; tentacles long, white, with blackish lines.

"Shell about three-eighths of an inch long, and two broad, convex above and flat underneath, obscurely striate transversely, of a greenish or whitish colour, variously chequered with spots on bands of white, brown, purple or pink; spire consisting of three volutions, the first very large, oblong, and oblique, the others small and lateral; aperture horizontal, semi-elliptic, with the margin sharp and entire; pillar white, transverse, sloping down to a sharp edge, and quite entire; operculum semilunar, yellowish, with an orange border, and underneath is a strong raised grooved spire at one end."—*Gray, p.* 83.

Very common in the river Lune, at Lancaster. In a kind of by-wash at the end of Lady's-walk, near the town, there is an embankment, where these shells adhere to the stones, the water flowing over them. Here the collector may walk upon the dry stones, and gather them with ease. Some five miles up the river rather finer specimens are found upon the stones at the bottom of the stream, which is only about two feet deep. In the Trent they are very clean and fine.

———"I have seen
A curious child, who dwelt upon a tract
Of inland ground, applying to his ear
The convolutions of a smooth-lipp'd shell,
To which, in silence hushed, his very soul
Listened intensely; and his countenance soon
Brightened with joy; for, murmurings from within
Were heard,—sonorous cadences! whereby,
To his belief, the monitor expressed
Mysterious union with its native sea."

Wordsworth.

GLOSSARY.

Acute—sharp, or sharp-edged.

Adherent—a shell which attaches itself is adherent.

Adherent—an operculum is adherent when fixed to the animal

Anterior—that half in bivalve shells which shows the cardinal ligament.

Aperture—the mouth of a shell.

Apex—the tip or small end of a shell.

Articulation—the insertion of parts of shells into each other.

Articulation—the teeth of bivalve shells are often articulated within each other.

Auriculated—having ears.

Axis—In univalve shells the centre or pillar upon which the spires turn.

Base—the lower part of a shell, or that which is opposed to the summit or point of the spire.

Base—some shells fix themselves by their base, to rocks and other bodies.

Beak—the elongated base of some species of univalve shells is called the beak.

Beak—the lengthened extremity of the valves in some Bivalve shells.

Bifid—separated down the middle by a slit.

Bivalve—a shell with two valves or pieces, connected by a hinge.

Body Whorl—the last whorl constituting the bulk of the shell

Byssus—a substance spun by the animal of bivalve shells, such as the Muscle, and the Pinna, by which they attach themselves to rocks and other bodies. In the Muscle it is called the beard.

Cardinal—principal teeth in the hinges of bivalve shells.

Cardinal Margin—the edge of a bivale shell on which the teeth are placed.

Carinated—a keel.

Cartilage--a solid substance harder than flesh, but not so hard as horn.

Cinereous—ash-coloured.

Clausium—a valve or folding-door

Close—shut together, without leaving any opening. It applies to bivalve shells.

Columella—the interior part of the lip, situate in the opening or mouth, very near the axis upon which the spires turn in univalve shells.

Compressed—nearly flat

Contour—the exterior surface, and round the edge of a shell.

Cordiform—heart-shaped.

Coriaceous—hard and fibrous; of a substance between horn and skin.

Corneus—horny.

Crenated—having blunt teeth.

Curved—arched or bent.

Decussated—striated cross ways.

Dentated—toothed

Depressed—flattened, pressed down.

Diaphanous—transparent when held to the light.

Dilated—expanded, spread.

Diverging—separating from a point.

Dorsal—belonging to the beak.

Elliptical—oval. Applied to any shell or part of a shell, having that form.

Epidermis—an outer skin or membrane, which covers the surface of the majority of shells.

Epiphragm—the membranaceous or calcareous substance by which some species of molluscus close the aperture of the shell, when they retire within it to hibernate.
Equilateral—the valves of bivalve shells are equilateral when they precisely resemble each other in size and form.
Equivalve—when the two valves are perfectly alike.
Exserted—standing out, protruding.
Fasciated—banded or striped.
Fissure—a notch or slit.
Flexuous—having windings or bendings.
Fosset—the cavity containing the ligament.
Fragile—tender, easily broken.
Furrow—a gutter or groove.
Gapers—shells whose valves never shut close.
Glabrous—smooth, uniform, polished.
Globose—rounded like a globe or ball.
Grained—dotted with small tubercles.
Granulated—covered with minute grains, rough.
Groove—a hollow prolonged line, placed between two ridges.
Group—the union of several shells that adhere together.
Hispid—covered with hairs.
Hyaline—glossy, thin, transparent.
Imbricated—tiled.
Imperforated—which has no hole, that is, is not pierced.
Impression—a trace or mark.
Inequilateral—of unequal sides.
Inequivalve—of unequal valves.
Incurved—turned inward or bent forward.
Indentated—exactly the reverse of dentated.
Inflected—turned inward.
Involute—without spires.
Keel—a flattened ridge, resembling the keel of a ship.
Lamina—a plait or layer.

Lanceolate—lengthened like a lance.

Lateral—belonging to the side.

Lenticular—of a lens shape.

Lid—operculum.

Lip—the last turn of the spire in univalves

Ligament—a horny substance uniting the valves of shells together at the hinge

Linear—very narrow

Lobate or lobed—divided into parts.

Longitudinal—lengthwise.

Margin—the edge of a shell.

Mollusca—animals inhabiting univalve shells.

Mouth—the aperture or opening of a shell.

Multivalve—having more than two valves.

Muricated—having sharp points or prickles.

Muscle—a flexible, fleshy, fibrous organ, by which the animals of bivalves are attached to their shells.

Nodose—having tubercles or knobs.

Nucleus—a kernel. Anything forming a centre around which matter is gathered.

Oblique—in a slanting direction.

Oblique—diverging from right to left, or from left to right.

Obtuse—blunt pointed.

Operculum—a horny substance generally round and flat, which fits exactly into the mouth of univalve shells.

Orbicular—of a round shape.

Ovate—egg-shaped or oval.

Oviparous Mollusca—those which produce their young in eggs

Pectinated—marked in a regular series of ridges.

Pedicle—a stalk.

Perforated—pierced, bored through.

Periostracum—the outer skin or surface of many shells called the epidermis.

Peristome—the edge of the aperture, including the inner and outer lips.

Peritreme—a term used to express the whole circumference of the aperture of a spiral shell.

Pillar—the axis upon which the spires turn in univalve shells.

Pisiform—of a pea-shape.

Plain—uniform, flat.

Plaited—many univalve shells are plaited on the columella, or pillar lip.

Posterior—that half from the hinge, in bivalve shells, which does not shew the cardinal ligament.

Produced—a term applied to the spire of univalve shells, or to any other prominent portion.

Pyriform—shaped like a pear

Quadrilateral—four-sided.

Radicated—attached, and as it were rooted by means of a fibrus byssus.

Ramose—spread out into branches.

Reflected—turned, or folded backward.

Reticulated—like net-work.

Ribs—protuberant striæ on the surface of a shell.

Rufous—reddish-brown.

Rugose—wrinkled, rough, rugged.

Scabrous—rough, rugged.

Semilunar—half-moon shaped.

Serrated—toothed like a saw.

Sinuous—waved, folded, or deeply lobed.

Sinuous—winding, serpentine.

Sinus—a deep cut.

Siphon—a pipe or tube.

Spine—a lengthened point, either straight or curved.

Spire—each single or separate turning, or circumvolution in a univalve shell, is called a spire.

Spiral—one or more spires of univalves.

Striæ—very fine lines, either flat or raised, which cross the surface of shells in different directions.

Striated—charged with striæ, marked with fine grooves or lines.

Sulcated—having grooves or furrows.

Summit—the highest part of a shell.

Summit—the upper part of the valves, in bivalve shells, is called the summit.

Suture—a toothed joint.

Teeth—protuberances and fangs on the hinges of bivalves.

Tentacula—the horns of the snail are its tentacula.

Testacea—all animals of the class Mollusca which are covered with a shell of carbonate of lime.

Transverse—across; bands or striæ, running across a shell, are called transverse.

Truncated—terminating abruptly, as it were cut short.

Tubercle—a protruberance raised on the surface of some shells

Umbo—the same as summit.

Umbilicus—a small hole at the bottom of univalve shells.

Undulated—minutely waved.

Univalve—a division of shells, composed of but one valve

Valve—the testaceous covering of the mollusca. When of a single piece, the shell is called Univalve; when of two pieces, Bivalve; and when formed of more parts than two, Multivalve.

Vertex—the top or point of a shell.

Viviparous—bringing forth the young alive.

Volutions—spiral turns in the columella, or the inner lip of univalves.

Waved—some shells are flexuous, bent in and out, or waved.

Whorl—the turning or wreath of the spire of univalves.

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